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## **Psylloidea of Korea (Homoptera: Sternorrhyncha)**

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## Psylloidea of Korea (Homoptera: Sternorrhyncha)

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### ABSTRACT

This paper treats the superfamily Psylloidea Burmeister, 1835 from Korea.

A total of 81 species belonging to 19 genera under 6 families are represented in Korean fauna, among them 1 subspecies, 26 species, 1 genus, 2 tribes with 1 subfamily are new to science, and 10 species are newly recorded from Korea. The following new taxa are proposed: Metapsyllinae subfam. nov., Eptiriozini trib. nov., Trichohermini trib. nov., *Koreaphalara koreana* gen. et sp. nov., *Aphalara jungsukae* sp. nov., *Psylla peninsularis* sp. nov., *P. peninsularis hanlasanensis* sp. et ssp. nov., *P. hanlabori* sp. nov., *P. palgongsana* sp. nov., *P. pseudoviburni* sp. nov., *P. juwangsana* sp. nov., *P. seungmoi* sp. nov., *P. seonhyeongae* sp. nov., *P. silvestris* sp. nov., *P. seolagsana* sp. nov., *P. koreacola* sp. nov., *P. quelparticola* sp. nov., *P. ulleungensis* sp. nov., *P. bibari* sp. nov., *P. jukyungi* sp. nov., *P. lineaticeps* sp. nov., *P. truncaticephala* sp. nov., *P. obongsana* sp. nov., *P. kwonnabiae* sp. nov., *P. sangjaei* sp. nov., *P. nopeunsanicola* sp. nov., *P. subcoccinea* sp. nov., *Bactericera brevitiformis* sp. nov., *B. koreostriola* sp. nov., and *B. nobilis* sp. nov.

The famous pear sucker, *Psylla pyricola*, and apple sucker, *P. mali* are discovered for the first time in Korea.

Keys are given for all the taxa respectively, some illustrations of various characters are provided. Host plants and domestic localities for each species are arranged.

### INTRODUCTION

The superfamily Psylloidea, or jumping plantlice, are one of the large groups belonging to sternorrhynchid insects represented by many genera and a very large number of species in all zoogeographic regions.

The adults are generally minute, not exceeding 6.5mm overall in length, and often very active with capable of leaping as well as flying, while the nymphs are less movable and often covered with conspicuous secretions of white waxy matter. They are quite phytophagous in both stages, and moreover very stenophagous in their feeding preferences especially in the immature stages, and some have been proven as vectors of several important economic plant pathogens, for instance:

pear sucker (*Psylla pyricola*) transmits fireblight at pear orchards in N. America, which vector had been imported accidentally from Europe where widely distributed, and now becomes discovered in Korea by the present study.

Potato psyllid (*Paratrioza cockerelli*) serves as a virus vector transmitting psyllid yellows in potatoes, tomatoes, eggplants, and peppers in N. America and Mexico.

Some species cause severe damage directly to cultivated crops, ornamental shrubs and forest by sucking on plant juices, or injecting toxic saliva into plants which may cause conspicuous galls, pseudo-galls, or stunting of host plants.

But previously their taxonomy as well as ecology are so insufficient that we could not provide a credible knowledge for control of these economically important pests in Korea. However, it was not until fairly recently, when many works have emerged a sound and reasonable classification system in accordance with the phylogenic nature for the taxonomic status of this group in abroad.

As for the Korean fauna, little has been introduced indeed the modern reconstructive system into the country. So, I intend to revise and arrange this group in Korea to be useful to entomologists and plant pathologists, because unsuitable older system is used yet by some domestic authors.

In the present study all the known species are revised critically, and totally 81 species belonging to 19 genera under 6 families are treated, among them 10 species of hitherto unrecorded from Korea, and 1 subspecies, 26 species, 1 genus, 2 tribes with 1 subfamily new to science respectively are added.

The keys separating all the taxa known from Korea are given. All the collected domestic localities are appeared here after the administrative geographical names of Republic of Korea, and the provinces are abbreviated as following:

CB : Chungcheongbugdo	HH : Hwanghaedo
CN : Chungcheongnamdo	HN : Hamgyeongnamdo
GB : Gyeongsangbugdo	JB : Jeonlabugdo
GG : Gyeonggido	JJ : Jejudo
GN : Gyeongsangnamdo	JN : Jeonlanamdo
GW : Gangweondo	PB : Pyeonganbugdo
HB : Hamgyeongbugdo	PN : Pyeongannamdo

The host plants which have been reported in Korea and observed by me with my students or colleagues are included after examined and compared with the known records of other countries when available, partial rectifications are also made to the wrong records as these pests are very specific in their choice of food plants.

All the morphological terms used here are followed after Hodkinson et White's (1979). Type-specimens and other most materials treated will be deposited in my collections of Systematic Entomology Laboratory, Department of Agricultural Biology, Kyungpook National University.

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## HISTORICAL REVIEW

Previous work on the jumping plantlice of Korea is very limited and little has been published extensively indeed.

So far as I am aware, Matsumura (1916, 1931) was the first who included Korea in the distribution range of *Aphalara nebulosa* in his famous works, the species was rectified later as *A. itadori* representing from Korea and Japan (by Miyatake, 1964b, 1965b). Doi (1938) reported unnamed one "*Psylla* sp" from Gaema Plateau. Shinji (1944) and Sasaki (1954) recorded the large pear sucker, *Psylla pyrisuga* occurring in Korea. Klimaszewski (1963b) described *Anomoneura koreana* based on the single female from "Keumkang Mts., 29, VIII, 1959, B. Pisarski Leg." (=Mt. Geumgangsán), which is now treated as a junior synonym of *A. mori*. He (1963d) also described *Craspedolepta evaiana* based on the 2 males and 6 females from "Onpho ad Tschongdschin, 14-16, VIII, 1959, Leg. B. Pisarski et J. Prószyński" (= Onpo near Cheongjin), shortly after.

In applied part, Paik et al. (1963) introduced *Psylla pyrisuga* in their textbook, Chon (1963, 1964) introduced and made a report on its control of mulberry sucker, *Anomoneura mori*, in Korea. Paik et Park (1963) listed 2 species as pests in Korea: *Anomoneura mori* and *Trioza nigra*.

Loginova (1964b) described *Psylla intacta* in treating psyllids of Kazakhstan where she put the material from Phunsan (= Pungsan, N. Korea) into the species.

Miyatake (1964a, 1965a) recorded the occurrence of *Psylla elaeagni* and *P. pyrisuga* in Korea, he (1965b, 1966) also recorded the distribution of *Aphalara itadori* from Korea along with Japan. Kim (1965, 1967) reported 3 species from Mt. Jirisan: Psyllidae sp. (=recently proved as *Pachypsylla japonica*), *Trioza camphorae* (= recently proved as *Heterotrioza chilgia*) and *Trioza ukogi*.

Klimaszewski (1967d) listed Korea in the distribution of *Psylla intacta*.

Loginova (1967a) recorded the occurrence of *Psylla vondraceki* and *P. intacta* in North Korea.

Klimaszewski (1968a) recorded *Diraphia jesoensis* (=now retained in the original genus *Livia*) and *Syntomoza humerosa* (= now ranked up in the genus *Syringilla*), with 2 new species: *Craspedolepta chonsamri* and *C. retracta*.

He (1968b) also recorded *Trioza obliqua obliqua* (= now transferred into the genus *Heterotrioza*) and described 2 new species: *Trioza myohyangi* and *T. koreana* (two were recently transferred into the genus *Bactericera*).

Miyatake (1969c) recorded Korea in the distribution of the 3 Japanese species: *Aphalara itadori*, *Psylla pyrisuga* and *P. elaeagni*. Ko (1969) listed 7 species known to occur till at that time in Korea as forest pests. Kim et al. (1970) surveyed preliminarily the damage by *Anomoneura mori* in sericulture from Korea. Kuwayama et Miyatake (1971) recorded Korea in the distribution

of the 2 species: *Psylla elaeagni* and *Trioza myohyangi*. Miyatake (1971a) briefly revised psyllids of Korea with additions of 5 species: *Psylla abietis*\*, *P. coccinea*\*, *P. elaeagnicola*\*, *Trioza* sp\*. (= *Trioza brevifrons*), *T. myohyangi*, *T. nigra*, and *Trichochermes grandis*\*. Baba et Miyatake (1971) recorded Korea in the distribution of *Diraphia jesoensis* and *Trioza nigra*. Kor. Soc. Pl. Prot. (1972) listed 7 species as pests in Korea, which were all after Ko's (1969) list. Klimaszewski (1973) catalogued 13 species known to occur in Korea from his check list. Loginova (1973) listed North Korea in the distribution of *Syringilla humerosa*, and she (1974a) included Korean Peninsula in the distribution of *Livia jesoensis*. Miyatake (1976) recorded Korea in the distributional range of 4 species in treating material from Is. Tsushima. He (1977) also included 6 species occurring in Korea along with Japan. Park et Lee (1978) made a nymphal biology of 3 species: *Anomoneura mori*, *Trioza maura* (= apparently misidentification of *Bactericera distinctissima*) and *Psylla jamatonica* (= now transferred into the genus *Acizzia*) in Korea. Ed. Dep. Hokuryukan (1979) also included Korea in the distribution of 5 species with Japan. Park et al. (1979) listed 9 species from Mt. Unmoonsan (= Mt. Unmunsan), of which 3 species (although they recorded 5 species, 2 were already reported) were added in Korean fauna: *Epitrioza mizuhonica*, *Psylla alni*, and *P. sasaki* (= already transferred into the genus *Acizzia* by Loginova, 1977).

They (1980a, b) recorded 26 species including 3 unidentified ones from Taegu (= Daegu) area, among them 6 species (although they reported 8 species, and further *Syntomoza magna* was apparently misidentification of *Syringilla humerosa* because its host plants are restricted in southern maritime area and several adjacent islands of Korean Peninsula) were added in Korea: *Psylla fulguralis*, *Metapsylla nigra*, *Euphalerus robinae*, *Calophya viridis* (= *C. shinjii*) and *C. nigra*. Park et Lee (1980a,b,c) described *Trioza chilgia* (= transferred into *Heterotrioza*) and recorded on the feeding habit of *Psylla hexastigma* (= transferred into *Cyamophila*), they also discussed on the variation of the forewing venation of *Anomoneura mori*.

It might be the latest work on the jumping plantlice of Korea produced by Kwon et Lee (1981) who revised the Triozidae from Korea, where they listed 20 species including 4 additional ones: *Epitrioza yasumatsui*, *Bactericera calcarata*, *B. striola* (described here as a new species) and *Trioza abdominalis*, along with 6 newly described ones: *Bactericera distinctissima*, *B. miyatakei*, *B. yamagishii*, *Heterotrioza noknamui*, *Trioza breviata*, and *T. mayicola*.

Therefore, prior to the present study a total of 45 species have been known to occur correctly in this country as discussed above.

## LIFE-HISTORY

The biology as well as life-history of jumping plantlice in Korea has been little reported and very few correct observative notes are now available to us.

A detailed unpublished data deposited and some recorded ones are combined into the following table 1.

## GENERAL MORPHOLOGY

**HEAD:** The head is considerably variable in form and shape or trend. It may be horizontally flat and elongate, or laminate with anterior margin concave in the family Liviidae; it is usually shorter than wide, horizontal and quadrate or flattened in the Aphalaridae, or it may be deflexed, vertical to obliquely inclined downwards in Psyllidae. Triozidae, Carsidaridae or Spondyliaspidae.

Table 1. Some life-history data for Korean jumping plantlice.

Plantlice	Number of generations per year	Overwintering stage			Time of adult appearance											
		Egg	Nymph	Adult	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
1. <i>L. Jessoensis</i>	1			+			+			+		+				
2. <i>Syn. magna</i>	1			+					+		+					
3. <i>Syr. humerosa</i>	1			+				+	+	+	+	+	+	+		
4. <i>K. koreana</i>	1			+					+							
5. <i>A. polygoni</i>	1			+			+	+	+	+	+	+	+	+	+	
6. <i>A. itadori</i>	2			+				+	+	+		+	+	+	+	
7. <i>A. jungsukae</i>	1			+			+	+	+	+	+			+		
8. <i>A. fasciata</i>	2-3			+			+	+	+		+	+				
9. <i>C. flava</i>	1			+							+					
10. <i>C. conspersa</i>	1			+					+		+	+		+		
11. <i>C. retracta</i>										+						
12. <i>C. evaiana</i>											+	+				
13. <i>C. chonsamri</i>													+			
14. <i>A. mori</i>	1			+		+	+	+	+	+	+	+	+	+	+	
15. <i>E. robinae</i>	1			+					+	+						
16. <i>M. nigra</i>	1			+					+		+					
17. <i>A. sasakii</i>	2			+			+	+	+	+	+	+	+	+		
18. <i>A. jamatonica</i>	2			+			+	+	+	+	+	+	+	+	+	
19. <i>C. hexastigma</i>	1			+			+		+	+	+	+	+	+		
20. <i>P. alni</i>	1	+								+	+	+	+			
21. <i>P. pyrisuga</i>	1	+		+				+	+	+	+	+	+			
22. <i>P. mali</i>	1	+							+	+	+	+	+	+		
23a. <i>P. peninsularis</i>										+						
23b. <i>sp. hanlasanensis</i>											+					
24. <i>P. fulguralis</i>	2			+				+	+	+	+	+	+	+		+
25. <i>P. elaeagni</i>	2			+			+	+	+	+	+	+	+	+		+
26. <i>P. hanlabori</i>											+					
27. <i>P. elaeagnicola</i>	1			+			+	+	+	+	+	+	+	+		
28. <i>P. palgongsana</i>								+								
29. <i>P. pseudoviburni</i>											+					
30. <i>P. juwangsana</i>									+		+					
31. <i>P. fatsiae</i>	1-2		+	+		+	+	+	+	+	+					+
32. <i>P. seungmoi</i>											+					
33. <i>P. intacta</i>												+				
34. <i>P. vondraceki</i>																
35. <i>P. seonhyeongae</i>											+					
36. <i>P. silvestris</i>	1			+					+	+						
37. <i>P. ambigua</i>	1		+						+							
38. <i>P. tobirae</i>	2		+	+					+		+					+
39. <i>P. rhododendri</i>	1			+				+	+	+	+					
40. <i>P. seolagsana</i>											+					
41. <i>P. koreacola</i>											+					
42. <i>P. coccinea</i>	2-3			+				+	+	+	+	+	+	+		+
43. <i>P. quelparticola</i>									+							
44. <i>P. ulleungensis</i>														+		
45. <i>P. bibari</i>									+							
46. <i>P. pyricola</i>	3?			+					+		+					
47. <i>P. jukyungi</i>	2			+			+		+	+						
48. <i>P. hederæ</i>	2-3		+	+					+		+	+		+		
49. <i>P. lineaticeps</i>									+		+	+				
50. <i>P. abieti</i>	1			+			+	+	+	+	+	+	+	+		
51. <i>P. truncaticephala</i>	1			+								+		+		
52. <i>P. obongsana</i>									+							
53. <i>P. kwonnabiae</i>									+							
54. <i>P. sangjaei</i>									+							
55. <i>P. nopeunsanicola</i>											+					
56. <i>P. subcoccinea</i>	1			+					+	+	+					
57. <i>Pa. japonica</i>	2	+							+	+	+	+	+	+		
58. <i>C. verticornis</i>				+			+									
59. <i>C. nigra</i>	1			+				+								
60. <i>C. shinji</i>	1			+					+	+						
61. <i>E. mizuhonica</i>	1			+				+	+	+	+	+		+		+
62. <i>E. yasumatsui</i>	1			+			+	+	+	+	+					
63. <i>T. grandis</i>	1			+					+	+	+					
64. <i>B. distinctissima</i>	1			+				+	+	+	+	+	+	+		+
65. <i>B. myohyangi</i>	1			+					+		+	+	+	+		
66. <i>B. breviatiformis</i>				+					+							
67. <i>B. calcarata</i>				+				+								
68. <i>B. miyatakei</i>				+						+						
69. <i>B. koreana</i>											+	+				
70. <i>B. koreostriola</i>	1			+	+				+							
71. <i>B. nobilis</i>								+								
72. <i>B. yamagishii</i>				+				+	+							
73. <i>H. obliqua</i>	3			+		+	+		+	+	+	+	+	+	+	
74. <i>H. ukogi</i>																
75. <i>H. chilgia</i>	1			+				+		+	+	+			+	
76. <i>H. noknamui</i>											+					
77. <i>T. brevifrons</i>									+					+		
78. <i>T. abdominalis</i>	1			+					+	+						
79. <i>T. breviata</i>										+						
80. <i>T. nigra</i>	2-3			+			+	+	+	+	+	+	+	+	+	
81. <i>T. mayicola</i>									+							

Y.J. KWON: Psylloidea of Korea

The vertex is divided by a median suture which is usually prominently grooved, it may be flat or depressed and often rounded forward or downward, sometimes incised anteriorly at apical portion of the median suture; two discal impressions are usually present on each side of median suture locating rather posteriorly; the lateral ocelli are located on the each posterior corner, quite close to the compound eyes.

The genae are often peculiarly specialized into a pair of anteriorly directed processes known as genal cones, but in the Liviidae and Aphalaridae the genae are not differentiated into processes.

The frons which bearing the median ocellus appears as a small free sclerite between genae in the genal cones-wanting families, but it may be rudimental and invisible only leaving prominent median ocellus because it is enveloped and covered by the bases of genal cones in the genal cones-developing families.

The clypeus is often well developed and pyriform in the Aphalaridae, usually short and concealed under genal cones in the most families.

The rostrum is three segmented and sharply flexed between the forecoxae.

The compound eyes are generally large and spherical, well extending beyond the lateral extremities of post-orbital ridges, but in the Liviidae they are scarcely bulging from head and less extending with a small preocular tubercle in front of each eye.

The antennae are usually 10 segmented or rarely reduced in number, filiform, the length is greatly variable bearing with 2 setae of different length on the apex.

**THORAX:** The prothorax is short and broadly transverse, may be arched or deflexed anteriorly. The pleural suture separates the episternum and epimeron vertically, diagonally or horizontally. The episternum may be equal in size to the epimeron, or may be larger but scarcely smaller.

The mesothorax is large and convex, and is divided into mainly praescutum, scutum and scutellum, they are comprising the largest part of the thorax.

The metathorax is weakly developed and usually concealed by the folded wings.

**WINGS:** The fore- and hindwings at rest are folded rooflike over the body, and are present in both sexes. The forewings are usually membraneous and transparent or often scattering color pattern, sometimes they are thickened and leathery, with their margin surrounded by the ambient vein. The shape maybe variable from elongate, oval, or rhomboidal. The pterostigma, costal gap, anal gap, surface spinules and radular spinules may be present or absent.

The venation is simple and longitudinal. Veins R, M, and Cu1 are fused into a prominent common stem, and they are bifurcated into R+Rs and M+Cu1 or trifurcated at one point independently in the Triozidae. M is branched into  $M_{1+2}$  and  $M_{3+4}$ , Cu1 is also branched into Cu1a and Cu1b. Rs is usually seldom branching but rarely may be divided into several branches and fused with  $M_{1+2}$  as seen from *Anomoneura*.

The hindwing has a series of hooklike setae on the basal portion of C+Sc which are coupled with forewing in flight. Vein R is generally wanting, but very rarely present in *Epitrioza*. M is always unforked distally.

**LEGS:** Fore- and middlelegs are simple and of similar structure. The hindlegs are large, strong, and saltatorial, thus are adapted for leaping; each metacoxa is large and generally bears a prominent posterior process, the meracanthus.

The hindtibia often bears a genual spine or sometimes a series of microspines at the base, and there is a crown of saltatorial spines variable in number on the apex which is always present. The tarsi are 2 segmented. The basal metatarsus often bears 2 or 1 saltatorial spines laterally but it may be entirely absent in certain many groups.

**ABDOMEN:** The abdomen consists of generally 10 segments. The first 2 segments are markedly or completely reduced and suppressed, the 3rd to 8th segments are easily visible in the abdomen and each with a pair of spiracles on the lateral sides. The posterior 2 segments are modified and represented by the genital structures.

**MALE GENITALIA:** The proctiger or anal tube is usually tubular and unipartite which bears the anus at the apex, it often bears posteriorly extended lobes or processes, rarely it may be appearing as bipartite.

The parameres or forceps are highly variable in form and shape or trend in different genera and species, they serve as an one of the most important specific characters in the classification.

The aedeagus or pennis has a 2 segmented structure, the distal segment may be generally swollen or widened at apex bearing with a tubular process where the ejaculatory duct connected, The proximal segment is usually long and bent at base, with dorsal side often striately wrinkled in the Aphalaridae.

The subgenital plate is almost uniform in shape throughout the group.

**FEMALE GENITALIA:** The female genitalia are usually wedge shaped, greatly variable in length, and comprise the dorsal valve or proctiger bearing the anus at base which generally narrowed to apex and thus more or less triangular in lateral shape, and the ventral valve or subgenital palte. These valves enclose the palps which carrying the valvulae ventralis and ovipositor.

The anus is consists of the perianal ring which may be bearing wax-secreting pores.

#### CHECK LIST OF KOREAN PSYLLOIDEA

##### Superfamily PSYLLOIDEA Burmeister, 1835

##### Family I. LIVIIDAE Loew, 1879

##### Genus 1. *Livia* Latreille, 1805

1. *Livia jesoensis* Matsumura, 1908

##### Family II. APHALARIDAE Loew, 1879

##### Subfamily APHALAROIDINAE Vondracek 1957

##### Genus 2. *Syntomoza* Enderlein, 1921

2. *Syntomoza magna* (Kuwayama, 1908)

##### Genus 3. *Syringilla* Loginova, 1967

3. *Syringilla humerosa* (Loginova, 1967)

##### Genus 4. *Koreaphalara* Kwon, gen. nov.

4. *Koreaphalara koreana* Kwon, gen. et sp. nov.

##### Subfamily APHALARINAE Loew, 1879

##### Genus 5. *Aphalara* Foerster, 1848

5. *Aphalara polygoni* Foerster, 1848
6. *Aphalara itadori* (Shinji, 1938)
7. *Aphalara jungsukae* Kwon sp. nov.
8. *Aphalara fasciata* Kuwayama, 1908

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Genus 6. *Craspedolepta* Enderlein, 1921

- 9. *Craspedolepta flava* (Kuwayama, 1908)
- 10. *Craspedolepta conspersa* (Loew, 1888)
- 11. *Craspedolepta retracta* Klimaszewski, 1968
- 12. *Craspedolepta evaiana* Klimaszewski, 1963
- 13. *Craspedolepta chonsamri* Klimaszewski, 1968

Family III. PSYLLIDAE Burmeister, 1835

Subfamily CIRIACREMINAE Crawford, 1914

Genus 7. *Anomoneura* Schwarz, 1896

- 14. *Anomoneura mori* Schwarz, 1896

Subfamily EUPHALERINAE Bekker-Migdisova, 1973

Genus 8. *Euphalerus* Schwarz, 1904

- 15. *Euphalerus robinae* (Shinji, 1938)

Subfamily METAPSYLLINAE Kwon subfam. nov.

Genus 9. *Metapsylla* Kuwayama, 1908

- 16. *Metapsylla nigra* Kuwayama, 1908

Subfamily ARYTAININAE Crawford, 1914

Genus 10. *Acizzia* Heslop-Harrison, 1961

- 17. *Acizzia sasakii* (Miyatake, 1963)
- 18. *Acizzia jamatonica* (Kuwayama, 1908)

Genus 11. *Cyamophila* Loginova, 1976

- 19. *Cyamophila hexastigma* (Horváth, 1899)

Subfamily PSYLLINAE Burmeister, 1835

Genus 12. *Psylla* Geoffroy, 1762

Subgenus *Psylla* Geoffroy, 1762

- 20. *Psylla* (s. str.) *alni* (Linnaeus, 1758)

Subgenus *Thamnopsylla* Loginova, 1978

- 21. *Psylla* (T.) *Pyrisuga* Foerster, 1848

Subgenus *Cacopsylla* Ossiannilsson, 1970

- 22. *Psylla* (C.) *mali* (Schmidberger, 1836)

- 23-A. *Psylla* (C.) *peninsularis* Kwon sp. nov.



23-B. *Psylla* (*C.*) *peninsularis hanlasanensis* Kwon sp. et ssp. nov.

Subgenus *Hepatopsylla* Ossiannilsson, 1970

24. *Psylla* (*H.*) *fulguralis* Kuwayama, 1908
25. *Psylla* (*H.*) *elaeagni* Kuwayama, 1908
26. *Psylla* (*H.*) *hanlabori* Kwon sp. nov.
27. *Psylla* (*H.*) *elaeagnicola* Miyatake, 1963
28. *Psylla* (*H.*) *palgongsana* Kwon sp. nov.
29. *Psylla* (*H.*) *pseudoviburni* Kwon sp. nov.
30. *Psylla* (*H.*) *juwangsana* Kwon sp. nov.
31. *Psylla* (*H.*) *fatsiae* Jensen, 1957
32. *Psylla* (*H.*) *seungmoi* Kwon sp. nov.
33. *Psylla* (*H.*) *intacta* Loginova, 1964
34. *Psylla* (*H.*) *vondraceki* Klimaszewski, 1963
35. *Psylla* (*H.*) *seonhyeongae* Kwon sp. nov.
36. *Psylla* (*H.*) *silvestris* Kwon sp. nov.
37. *Psylla* (*H.*) *ambigua* Foerster, 1848
38. *Psylla* (*H.*) *tobirae* Miyatake, 1964
39. *Psylla* (*H.*) *rhododendri* Puton, 1871
40. *Psylla* (*H.*) *seolagsana* Kwon sp. nov.
41. *Psylla* (*H.*) *koreacola* Kwon sp. nov.
42. *Psylla* (*H.*) *coccinea* Kuwayama, 1908
43. *Psylla* (*H.*) *quelparticola* Kwon sp. nov.
44. *Psylla* (*H.*) *ulleungensis* Kwon sp. nov.
45. *Psylla* (*H.*) *bibari* Kwon sp. nov.
46. *Psylla* (*H.*) *pyricola* Foerster, 1848
47. *Psylla* (*H.*) *jukyungi* Kwon sp. nov.
48. *Psylla* (*H.*) *hederae* Miyatake, 1964
49. *Psylla* (*H.*) *lineaticeps* Kwon sp. nov.
50. *Psylla* (*H.*) *abieti* Kuwayama, 1908
51. *Psylla* (*H.*) *truncaticephala* Kwon sp. nov.
52. *Psylla* (*H.*) *obongsana* Kwon sp. nov.
53. *Psylla* (*H.*) *kwonnabiae* Kwon sp. nov.
54. *Psylla* (*H.*) *sangjaei* Kwon sp. nov.
55. *Psylla* (*H.*) *nopeunsanicola* Kwon sp. nov.
56. *Psylla* (*H.*) *subcoccinea* Kwon sp. nov.

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Family IV. SPONDYLIASPIDAE Schwarz, 1898

Subfamily PACHYPSYLLINAE Crawford, 1914

Genus 13. *Pachypsylla* Riley, 1885

57. *Pachypsylla japonica* Miyatake, 1968

Family V. CARSIDARIDAE Crawford, 1914

Subfamily CALOPHYINAE Vondracek, 1957

Genus 14. *Calophya* Loew, 1879

58. *Calophya verticornis* Kwon sp. nov.  
59. *Calophya nigra* Kuwayama, 1908  
60. *Calophya shinjii* Sasaki, 1954

Family VI. TRIOZIDAE Loew, 1879

Tribe EPITRIOZINI Kwon trib. nov.

Genus 15. *Epitrioza* Kuwayama, 1910

61. *Epitrioza mizuhonica* Kuwayama, 1910  
62. *Epitrioza yasumatsui* Miyatake, 1978

Tribe TRICHOCHERMINI Kwon trib. nov.

Genus 16. *Trichochermes* Kirkaldy, 1904

63. *Trichochermes grandis* Loginova, 1965

Tribe TRIOZINI Loew, 1879

Genus 17. *Bactericera* Puton, 1876

Subgenus *Smirnovia* Klimaszewski, 1968

64. *Bactericera* (S.) *distinctissima* Kwon et Lee, 1981  
65. *Bactericera* (S.) *myohyangi* (Klimaszewski, 1968)  
66. *Bactericera* (S.) *breviatiformis* Kwon sp. nov.  
67. *Bactericera* (S.) *calcarata* (Schaefer, 1949)  
68. *Bactericera* (S.) *miyatakei* Kwon et Lee, 1981  
69. *Bactericera* (S.) *koreana* (Klimaszewski, 1968)  
70. *Bactericera* (S.) *koreostriola* Kwon sp. nov.  
71. *Bactericera* (S.) *nobilis* Kwon sp. nov.  
72. *Bactericera* (S.) *yamagishii* Kwon et Lee, 1981

Genus 18. *Heterotrioza* Dobreanu et Manolache, 1962

Subgenus *Heterotrioza* Dobreanu et Manolache, 1962

73. *Heterotrioza* (s. str.) *obliqua* (Thomson, 1877)Subgenus *Dyspersa* Klimaszewski, 196874. *Heterotrioza* (*D.*) *ukogi* (Shinji, 1940)75. *Heterotrioza* (*D.*) *chilgia* (Park et Lee, 1980)76. *Heterotrioza* (*D.*) *noknamui* Kwon et Lee, 1981Genus 19. *Trioza* Foerster, 184877. *Trioza brevifrons* Kuwayama, 191078. *Trioza abdominalis* Flor, 186179. *Trioza breviata* Kwon et Lee, 198180. *Trioza nigra* Kuwayama, 191081. *Trioza mayicola* Kwon et Lee, 1981

## SYSTEMATICS

## Key to families of Psylloidea from Korea

1. Vertex laminately elongate, at least as long as broad. Eyes not extending beyond the lateral extremities of post orbital ridges. 2nd antennal segment greatly inflated, largest ..... **Liviidae**  
 —. Vertex shorter than broad. Eyes usually extending well beyond the lateral extremities of post orbital ridges. 2nd antennal segment smaller than the 1st ..... 2.
2. Forewings with veins Cul and M not having common stem, each arising independently from vein R, at one point; costal gap absent ..... **Trioziidae**  
 —. Forewings with veins Cul and M having common stem arising from vein R; costal gap usually present ..... 3.
3. Genal cones entirely absent. Frons clearly visible as free sclerite on face. Hindtibia with apical crown of at least 5 or more thick spines ..... **Aphalaridae**  
 —. Genal cones usually conspicuous, or very rarely rudimental. Frons generally reduced, enveloped between bases of genal cones, or rarely visible. Hindtibia usually with 6 or less apical spines ..... 4.
4. Antennae often short, not exceeding head width including eyes. Forewings with cell cul prominently larger and higher in size than cell m2. Basal metatarsus without saltatorial spines ..... **Carsidaridae**  
 —. Antennae at least as long as or distinctly longer than head width including eyes. Forewings with cell cul smaller, approximately equal in size to cell m2. Basal metatarsus usually with 1 or 2 saltatorial spines ..... 5.
5. Head strikingly vertical, narrower than thorax. Male proctiger bipartite. Female proctiger semicircular, strongly roundly terminated in lateral aspect ..... **Spondyliaspidae**  
 —. Head less vertical, nearly as wide as thorax. Male proctiger unipartite. Female genitalia wedge shaped, varied in length ..... **Psyllidae**

Family I. LIVIIDAE Loew, 1879 (Jugeog-namui-gwa)

Head usually horizontal, directed anterad. Vertex flat, somewhat depressed; anterior margin concave at middle, more or less dully produced on each side of middle. Genal cones absent. Frons prominently visible, located beneath vertex, not covered by genae. Eyes scarcely bulging from head, with a small preocular tubercle in front of each eye. Antennae usually short, 2nd segment larger than any other one.

Prothorax with epimeron and episternum divided by horizontal suture.

Forewings thick, opaque, relatively broad oval, with membrane more or less wrinkled; pterostigma absent.

Male proctiger generally simple tubular without lobes on posterior margin. Parameres broad, with apices narrowed. Aedeagus with apex moderately swollen.

Female genitalia mostly longer than wide.

Generally a small family containing hitherto 22 species belonging to only one genus *Livia* Latreille, 1804, represented in Palaearctic and Oriental Regions. Formerly known the 2nd genus *Diraphia* Waga, 1842 was placed into the synonymy of the preceding one by Loginova (1974).

Most species are associated with *Juncus* and *Carex*, the monocotyledonous plants, in wet biotopes.

Genus 1. *Livia* Latreille, 1805 (Jugeog-namui-sog)

*Livia* Latreille, 1805, Hist. nat. Ins. 12:374.

Type-species: *Psylla junicorum* Latreille, 1798

Type-locality: France.

*Diraphia* Waga, 1842, Ann. Soc. Ent. Franc. 11:275-278.

Type-species: *Diraphia limbata* Waga, 1842

Type-locality: Poland.

*Neolivia* Hedicke, 1920, Deutsch. Ent. Zeitschr. 1(2): 65-75.

Type-species: *Diraphia limbata* Waga, 1842

Type-locality: Poland.

Head more or less flat dorso-ventrally. Vertex somewhat depressed near middle; anterior margin concave at middle, produced on each side and overhanging antennal sockets. Eyes not extending beyond the lateral extremities of post orbital ridges, with a small praeocular tubercle in front of each eye. Genal cones absent, only obscurely convex on genae. Frons large, prominently visible under vertex not covered by genae, bearing a large median ocellus, not visible from above. Antennae short, with 2nd segment greatly swollen, longer and larger than the other segments.

Forewings more or less opaque, thick, broad oval, often maculate, with membrane somewhat wrinkled irregularly.

Pronotum rectangular in dorsal aspect, scarcely exceeding as broad as head including eyes.

Male proctiger simple tubular, with apex more or less broadly truncate. Parameres usually shorter than proctiger, rather broad, somewhat pointed apically. Aedeagus with distal segment relatively long, apex moderately swollen.

Female proctiger long, with dorsal side more or less straight or sinuate; length of anus shorter than remainder of proctiger.

In Korea only single species is known to occur.

1. *Livia jesoensis* Matsumura, 1908 (Jugeog-namui)

*Livia jesoensis* Matsumura in Kuwayama, 1908, Trans. Sapp. Nat. Hist. Soc. 2:150-151.

*Livia jesoensis*: Aulmann, 1913, Psyll. Cat.: 76.

*Diraphia jesoensis*: Kuwayama, 1950, Icon. Ins. Jap. ed. sec.: 331.

*Diraphia jesoensis*: Sasaki, 1954, Sci. Rep. Mats. Agr. Coll. 14:30.

*Diraphia jesoensis*: Miyatake, 1964b, Bull. Osaka Mus. Nat. Hist. 17:24.

*Diraphia jesoensis*: Miyatake, 1965a, Icon. Ins. Jap. Col. Nat. ed. 3:147, p.1.74(4).

*Diraphia jesoensis*: Loginova, 1967b, Ent. Obozr. 46(2):338.

*Diraphia jesoensis*: Klimaszewski, 1968a, Bull. Acad. Pol. Sci. Cl.2. 16(5):285-286<sup>①</sup>.

*Diraphia jesoensis*: Miyatake, 1969c, Bull. Osaka Mus. Nat. Hist. 22:67-68.

*Diraphia jesoensis*: Miyatake, 1971a, Ibid. 24:1 (Korea).

*Diraphia jesoensis*: Baba et Miyatake, 1971, Ibid. 24:7-8 (Korea).

*Diraphia jesoensis*: Klimaszewski, 1973, Ann. Zool. 30(7):157 (Korean Peninsula).

*Livia jesoensis*: Loginova, 1974a, Zool. Zh. 53(5): 860, 862 (Korean Peninsula).

*Diraphia jesoensis*: Miyatake, 1977, Col. Ill. Ins. Jap. 2:161, p.1. 38(607) (Korea).

*Diraphia jesoensis*: Miyatake, 1979, Ins. Nūgata Pref. 50:213.

*Diraphia jesoensis*: Ed. Dep. Hokuryukan, 1979, Ill. Ins. Jap. Stud. ed.: 92 (Korea).

*Diraphia jesoensis*: Lee et Kwon, 1981, Rep. Kor. Ass. Cons. Nat. 19:152<sup>②</sup>.

**Type-locality:** Japan.

**Description:** General coloration yellowish brown to reddish brown, much darker in tint in overwintering specimens.

Vertex laminate, extended anteriorly; apical margin subtriangularly produced on each side of median suture; disc broadly concave. Eyes not extending beyond the lateral extremities of post orbital ridges. Antennae nearly as long as width of head including eyes; 2nd segment inflated and largest, with apical 2 segments dark.

Forewings ovate, somewhat light brown; apical portions scattered with irregular brown patches, which extending on inner margins; apex broadly rounded.

Male proctiger simple tubular, somewhat rectangular in lateral aspect, slightly longer than subgenital plate. Parameres rather broad; anterior margins narrowed to apices, with tips shortly curved cephalad. Aedeagus with distal segment slender at middle portion, moderately swollen at apex.

Female proctiger longer than subgenital plate, with slightly wavy dorsal margin in lateral view; length of anus shorter than remainder of proctiger.

**Length:** Body male 2.3 - 2.5mm, female 2.6 - 2.8mm; to tip of folded wings male 3.1 - 3.2mm, female 3.3 - 3.5mm.

**Locality:** GB : Is. Ulreung (=Is. Ulleungdo; Dodong)<sup>②</sup>.

GN : Mt. Geumsan.

HN : Čangdžin-ho (= Jangjinho Lake)<sup>①</sup>.

**Distribution:** Korea, Japan (Hokkaido, Honshu, Kyushu, Shikoku).

**Host-plant:** *Juncus leschenaultii*.

## Family II. APHALARIDAE Loew, 1879 (Allag-namui-gwa)

Head weekly to moderately deflexed. Vertex shorter than broad, with discal impressions prominent or obscure. Genal cones entirely absent, with genae smoothly rounded or slightly

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convex ventral to antennal sockets. Frons clearly visible as a free sclerite on ventral surface of head. Antennae short or long, 2nd segment narrower than 1st one and shorter than 3rd one.

Forewings membranous, or sometimes thick, transparent or often with color pattern; gap on costal vein present; pterostigma present or absent; vein Cu1 + M always with a common stem arising from R.

Hind tibia with apical crown of at least 6 thick saltatorial spines.

Male proctiger with or without horizontal processes posteriorly. Parameres longer than wide, with or without inner teeth at apices. Aedeagus with proximal segment frequently striately wrinkled on dorsal side.

Female genitalia usually longer or as long as wide, wedge shaped.

Generally a large family containing hitherto more than 185 species belonging to 30 genera under 3 subfamilies in Palaearctic Region, and distributed in Holarctic and Ethiopian Regions.

Feeding on a wide variety of herbs and trees. In Korea 12 species belonging to 5 genera under 2 subfamilies are represented.

**Key to Subfamilies of Korean Aphalaridae**

1. Forewings with pterostigma always present. Male proctiger without long processes posteriorly, only widened in the form of a lobe . . . . . **Aphalaroidinae**  
— Forewings with pterostigma absent or rarely well developed. Male proctiger bearing a pair of long narrow horizontal processes posteriorly . . . . . **Aphalarinae**

**Subfamily APHALAROIDINAE Vondracek, 1957 (Sanyuja-namui-agwa)**

Head usually broader than long, somewhat flat, in lateral view with clypeus scarcely visible. Vertex more or less concave at middle, broader than long, with discal impressions; posterior margin generally straight. Genal cones absent, with genae only slightly convex ventral to antennal sockets. Frons prominent or greatly reduced, with median ocellus visible or invisible from above. Post orbital ridges prominent, usually not exceeding eyes, rarely strikingly developed and exceeding eyes. Antennae shorter or longer than head including eyes.

Prothorax somewhat rectangular in dorsal view, a little exceeding or narrower than head including eyes.

Forewings generally thick, opaque, or rarely transparent and membranous; usually broad and oval or elongate oval; pterostigma present.

Male proctiger without long horizontal processes posteriorly, only widened in the form of a lobe, or simple tubular. Parameres shorter than proctiger, without inner processes at apices. Aedeagus with proximal segment smoothly surfaced on dorsal side. Female genitalia varied.

In Korea, 3 species belonging to 3 genera respectively under the tribe Euphyllurini Loginova, 1973.

**Key to genera of Aphalaroidinae**

1. Head and pronotum horizontal, and nearly as same level with mesothoracic scutum in lateral view. Antennae slightly exceeding head including eyes. . . . . **Koreaphalara** gen. nov.  
— Head and pronotum nearly vertical to mesothoracic scutum in lateral view. Antennae shorter than head including eyes. . . . . 2.
2. Eyes extending beyond the lateral extremities of post-orbital ridges. Male proctiger with subtriangular lobes posteriorly . . . . . **Syntomoza**

- Eyes not extending beyond the lateral extremities of post-orbital ridges which are well developed or narrowed. Male proctiger long, simple tubular . . . . . *Syringilla*

Genus 2. *Syntomoza* Enderlein, 1921 (Sanyuja-namui-sog)

*Syntomoza* Enderlein, 1921, Zool. Anz. 52(5):117.

Type-species: *Euphyllura magna* Kuwayama, 1908

Type-locality: Japan.

Body generally large sized. Head including eyes much shorter than half as long as wide at median length. Vertex somewhat flat, slightly exceeding half as long as wide. Genal cones rudimental, only somewhat roundly produced antero-ventrally. Median ocellus invisible from above. Eyes rather large, spherical, extending well beyond the lateral extremities of post orbital ridges which are narrowed to distad in dorsal view. Lateral ridges of antennal sockets relatively obscure. Antennae short, less than width of head including eyes.

Forewings broad, rhomboidal, thick and leathery, more or less opaque; posterior margin somewhat paralleled to anterior one; outer margin of cell cul not extending; pterostigma very narrow; vein Cula more or less straight, cell cul usually larger than m2. Hindwings with veins R and M more or less subparallel distally.

Hindlegs simple, without basal trasal spines laterally, with a meracanthus short and less sharp.

Male proctiger longer than parameres, subtriangularly strikingly extended posteriorly. Parameres relatively narrow and slender, pointed apically.

A monotypic genus representing in Korea and Japan.

## 2. *Syntomoza magna* (Kuwayama, 1908) (Sanyuja-namui)

*Euphyllura magna* Kuwayama, 1908, Trans. Sapp. Nat. Hist. Soc. 2:151-152, pl. 3(1,8).

*Euphyllura magna*: Aulmann, 1913, Psyll. Cat.: 67.

*Syntomoza magna*: Enderlein, 1921, Zool. Anz. 52(5):117.

*Syntomoza magna*: Kuwayama, 1939, Zool. Mag. 51(7):535.

*Syntomoza magna*: Kuwayama, 1950, Icon. Ins. Jap. ed. sec.: 328.

*Syntomoza magna*: Sasaki, 1954, Sci. Rep. Mats. Agr. Coll. 14:30.

*Syntomoza magna*: Miyatake, 1965a, Icon. Ins. Jap. Col. Nat. ed. 3:147, pl. 74(5).

*Syntomoza magna*: Loginova, 1967b, Ent. Obozr. 46(2):340.

*Syntomoza magna*: Klimaszewski, 1973, Ann. Zool. 30(7):162.

*Syntomoza magna*: Loginova, 1973, Zool. Zh. 52(6):860.

Type-locality: Japan.

**Description:** General coloration dirty yellowish brown to ochreous, scattered with numerous dark brown to black spots and several dark patches on head and thorax.

Vertex slightly longer than half as long as wide at median length. Genal cones rudimental, only slightly roundly extending. Eyes spherical, extending beyond the lateral extremities of post-orbital ridges which less developed and narrow. Antennae shorter than width of head including eyes, mostly light brown, excepting basal 2 and apical 3 segments with distal portions of 4th to 6th segments which are dark to black.

Forewings somewhat parallelogramy, broad; membrane a little opaque, pale yellowish brown to dirty yellowish brown, scattered with numerous irregular dark brown spots, and sometimes dark patches; vein Cula rather straight; cell m2 apparently smaller than cul. Hindwings with veins R and

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M more or less subparallel distally.

Male proctiger longer than subgenital plate, with a pair of prominent subtriangular broad lobes posteriorly. Parameres long, narrowed to apices; tips pointed and directed cephalad. Aedeagus rather straight, with apex enlarged on upper side; distal segment greatly exceeding half as long as proximal one.

**Length:** Body male 2.0 - 2.1mm, female 2.1 - 2.2mm; to tip of folded wings male 2.8 - 3.0mm, female 3.0 - 3.2mm.

**Locality:** JJ: Jungmun.

**Distribution:** Korea, Japan (Kyushu, Shikoku).

**Host-plant:** *Xylosma congestum*.

Formerly recorded locality (Pagaesa Temple: Park et al., 1980b) was error and must be referred the following species.

Genus 3. *Syringilla* Loginova, 1967 (Mulpure-namui-sog)

*Syringilla* Loginova, 1967b. Ent. Obozr. 46(2):341-342.

Type-species: *Syntomoza (Syringilla) humerosa* Loginova, 1967.

Type-locality: U.S.S.R. (Maritime Territory).

Body generally large sized. Head including eyes much less than half as long as wide mesally. Vertex transversely broad and flat, nearly half as long as wide. Genal cones absent, with genae more or less obscurely broadly truncate anteriorly. Frons greatly reduced, only leaving very narrow margin around median ocellus which is prominent and clearly visible from above.

Eyes less convex, somewhat oval, not extending beyond the lateral extremities of post-orbital ridges which are strikingly developed. Antennae shorter than width of head including eyes.

Forewings more or less rhomboidal, broadest at middle to apical third, with outer margin of cell cul roundly extending; pterostigma narrowly present; vein Cula deeply round, cell cul usually slightly smaller than m2. Hindwings with veins R and M distinctly divergent distally.

Hindlegs armed with a pair of basal tarsal spines laterally, and with a meracanthus relatively moderate.

Male proctiger long and slender, usually simple tubular. Parameres shorter than proctiger, with apical portion extended; inner surface of apex armed with numerous short spines.

Female genitalia relatively short.

Monotypic genus representing in continental Far East Asia. This genus had been treated as a subgenus of *Syntomoza* Enderlein, 1921, but recently, the errector, Loginova (1973) ranked it up as an independent generic status and placed both into the tribe Euphyllurini Loginova, 1973.

3. *Syrigilla humerosa* (Loginova, 1967) (Mulpure-namui)

*Syntomoza (Syringilla) humerosa* Loginova, 1967b, Ent. Obozr. 46(2):342.

*Syntomoza humerosa*: Klimaszewski, 1968a, Bull. Acad. Pol. Sci. Cl. 2. 16(5): 286<sup>①, ②</sup>.

*Syntomoza humerosa*: Miyatake, 1971a, Bull. Osaka Mus. Nat. Hist. 24: 1 (Korea).

*Syntomoza humerosa*: Klimaszewski, 1973, Ann. Zool 30(7): 162 (Korean Peninsula).

*Syrigilla humerosa*: Loginova, 1973. Zool. Zh. 52(6):860 (North Korea).

*Syntomoza (Syringilla) humeroza* (sic): Bekker-Migdisova, 1973, Dok. nadv. chetv. esch. chten. pamy. N. A. Khol. 1971:38.

*Syntomoza magna* (nec Kuwayama): Park et al., 1980b, Nat. & Life 10(1):14<sup>③</sup>.



**Type-locality:** U.S.S.R. (Maritime Territory).

**Description:** General coloration dirty yellowish brown scattered with numerous dark brown spots, abdomen dark brown. Vertex about half as long as wide at median length, with discal impressions somewhat broadly transversely concave on next to each center, anterior margin rather truncate, posterior margin somewhat straight, median ocellus prominently visible in dorsal view. Eyes relatively small and oval, not extending beyond the lateral extremities of post-orbital ridges which are well developed. Antennae shorter than head including eyes.

Forewings ovate, broadly rounded at apical margin, widest at middle to apical third; membrane somewhat opaque, pale yellow to dirty yellowish brown, scattered with numerous irregular dark brown spots, and rarely with dark patches; vein Cula roundly curved, cell m2 usually larger than cul. Hindwings with veins R and M apparently divergent apically.

Male proctiger nearly twice as long as subgenital plate, simple tubular, without broad processes on ventral margin. Parameres with apical portions produced caudad; inner surfaces of apices armed with numerous short spines.

Aedeagus long, base and apex slightly inflated.

Female proctiger longer than length of anus, shorter than remainder of proctiger.

**Length:** Body male 2.3 - 2.5mm, female 2.6 - 2.9mm; to tip of folded wings male 3.3 - 3.5mm, female 3.6 - 3.8mm.

**Locality:** GB : Mt. Hwanghagsan, Pagaesa Temple (= Pagyesa Temple)<sup>③</sup>, Mt. Palgongsan.

GG : Gwangleung, Mt. Myeongjisan.

GN : Mt. Gayasan, Mt. Jirisan, Mt. Weonhyosan, Mt. Yeongchuisan.

GW : Mt. Obongsan, Mt. Odaesan, Mt. Seolagsan.

HB : Musu-ri distr. Purjong (= Buryeong)<sup>①</sup>, Onpo-ri distr. Kjongsong (=Gyeongseong)<sup>②</sup>

**Distribution:** Korea, U.S.S.R. (Maritime Territory).

**Host-plant:** *Syringa robusta*, *Fraxinus rhynchophylla*.

Genus 4. *Koreaphalara* Kwon, gen. nov. (Hangug-namui-sog)

Type-species: *Koreaphalara koreana* Kwon, gen. et sp. nov.

Type-locality: Korea.

Body generally small sized, somewhat flat dorsally. Head and pronotum horizontal, nearly as same level with mesothoracic scutum in lateral view. Vertex distinctly shorter than broad, obscurely concave at middle of anterior margin, with posterior margin more or less straight. Median ocellus scarcely visible in dorsal view. Frons large, subtriangular, not covered by genae. Genae rather roundly swollen on each side of frons, but never produced into cones. Clypeus short cornical, not reaching anterior margin of head. Antennae slightly exceeding width of head including eyes.

Pronotum nearly as wide as head including eyes, short, rectangular. Forewings somewhat elongate or ovate, rounded at apices, rather thick and semitransparent; pterostigma narrow.

Hindtibia without genual spine at base, with 5 saltatorial spines arranged 1+1+2+1 at apex; basal metatarsus armed with 2 saltatorial spines.

Male proctiger simple, somewhat tubular, without horizontal processes or lobes posteriorly. Parameres shorter than proctiger, more or less broad.

Monotypic genus described as here.

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4. *Koreaphalara koreana* Kwon, gen. et sp. nov. (Hangug-namui)

**Description:** General coloration yellow green, with olive green tints on dorsum and vertex. Vertex longer than half as long as wide (ratio, 9: 13); anterior margin somewhat truncate which incised obscure mesally, with discal impressions centrally on each side of median suture. Antennae about 1.1 times as long as width of head including eyes, with apical 2 segments and distal half of 8th segment dark brown to black.

Forewings pale yellow, membrane somewhat roughly surfaced, with prominent dark spots on each terminations of Rs,  $M_{1+2}$ ,  $M_{3+4}$ , Cula, and Culb. Venation characteristic, as in figure.

Male proctiger long, tubular, without any horizontal processes posteriorly; apical portion of posterior margin narrowed in lateral view. Parameres shorter than proctiger, gently curved inner wards, with tips somewhat obtusely pointed, bearing with a small tooth on each inner side of postero-basal portion. Aedeagus with discal segment simple, somewhat slender at middled portion, more or less enlarged at apical portion.

Female genitalia longer than wide. Proctiger with apex dully pointed; length of anus very slightly less than half as long as remainder of proctiger.

**Length:** Body male 1.67mm, female 1.78mm; to tip of folded wings male 2.12mm, female 2.23mm.

**Type-examined:** Holotype male, Mt. Palgongsan, GB, S. Korea, 23, V, 1981, coll. Y.J. Kwon; paratypes: 1 female, same data as holotype; Mt. Myeongseongsan, GG, C. Korea, 1 male, 3 females, 16, V, 1982, coll. Y.J. Kwon.

**Remark:** The present genus is related to *Camarotoscena* Haupt, 1935 and *Strophingia* Enderlein, 1914, but easily separated from it by the characteristic wing venation and male genitalia.

**Host-plant:** Unknown, possibly *Rhus javanica* or *Rhus* sp.

Subfamily APHALARINAE Loew, 1879 (Allag-namui-agwa)

Head much broader than long, in lateral view with clypeus usually distinctly protruberant. Vertex broader than long, with anterior margin slightly or deeply concave on the apex of median suture; discal impressions present, rather next to middle or posteriorly. Genal cones absent, with genae smooth or forming small rounded tubercles ventral to antennal sockets. Frons usually prominent, bearing median ocellus partly visible or scarcely visible from above. Post orbital ridges generally less than eyes. Antennae shorter or exceeding head including eyes.

Forewings transparent, membraneous, or often thick, opaque with color pattern, usually elongate; pterostigma absent or rarely well developed; costal gap present.

Male proctiger with long horizontal processes posteriorly always present. Parameres more or less extending apically, with a prominent inner tooth. Aedeagus with proximal segment striately wrinkled on dorsal side; distal segment greatly swollen at apex, mostly sharply pointed on lower tip.

Female genitalia varied, more or less wedge shaped.

In Korea 9 species belonging to 2 genera are occurred.

Key to Genera of Aphalarinae

1. Clypeus long, conically inflated in lateral view, and projecting to anterior margin of head. Genae forming small rounded tubercles ventral to antennal sockets. . . . . *Aphalara*  
— Clypeus short, not reaching anterior margin of head. Genae not forming rounded tubercles ventral to antennal sockets . . . . . *Craspedolepta*.

Genus 5. *Aphalara* Foerster, 1848 (Allag-namui-sog)*Aphalara* Foerster, 1848, Verh. nat. Ver. preuss. Rheinl. 3:67.Type-species: *Chermes calthae* Linnaeus, 1761

Type-locality: Sweden.

Head including eyes usually exceeding twice as wide as long, somewhat flat. Vertex rather angular anteriorly, divided from genae by narrow grooves; discal impressions present. Genae forming small rounded tubercles ventral to antennal sockets. Clypeus long and cylindrical, conically inflated anteriorly, in lateral view projecting to anterior margin of head. Frons prominent, with a median ocellus partly visible from above. Antennae a little shorter or slightly exceeding width of head including eyes.

Forewings elongate, usually transparent membranous, often with cloudy color pattern; pterostigma entirely absent.

Hindtibia with at most 12 saltatorial spines at apex; basal metatarsus armed with 2 saltatorial spines.

Male proctiger with long horizontal processes posteriorly, which bearing a hook-like process curved innerward on ventral margin. Parameres slightly extending apically, with a prominent inner tooth. Aedeagus with distal segment greatly inflated at apex, with a small short tip.

Female genitalia shorter than wide or rarely much exceeding.

Generally a large Holarctic genus associated with plants of Polygonaceae.

In Korea 4 species occur.

Key to Species of *Aphalara*

1. Forewings with yellowish brown or dark brown to black color pattern, forming mostly irregular oblique transverse band . . . . . 2.
  - Forewings without distinct color pattern except for single dark spot on vein Culb, with membrane slightly yellow at least in apical half of wing . . . . . *A. polygoni*
2. Forewings oval, about two times as long as broad, color pattern dark to black, conspicuously present in basal half . . . . . *A. itadori*
  - Forewings elongate, evidently exceeding two times as long as broad, color pattern yellowish brown to dark brown, lacking or obscurely present in basal half . . . . . 3.
3. Forewings less than 2.3 times as long as broad. Inner tooth of male paramere short, very slightly separated from rest of paramere . . . . . *A. jungsukae*
  - Forewings narrower, more than 2.4 times as long as broad. Inner tooth of male paramere long, deeply separated from rest of paramere . . . . . *A. fasciata*

5. *Aphalara polygoni* Foerster, 1848 (Tumyeongallag-namui)

*Aphalara polygoni* Foerster, 1848, Verh. nat. Ver. Preuss. Rheinl. 3:90.

*Aphalara polygoni*: Douglass, 1879. Ent. Monthl. Mag. 15:255.

*Aphalara calthae* (nec Linnaeus): Kuwayama, 1908, Trans. Sapp. Nat. Hist. Soc. 2:154.

*Aphalara calthae* (nec Linnaeus): Aulmann, 1913, Psyll. Cat.: 62-63.

*Psylla artemisifoliae* Shinji, 1938a, Kontyu 12(4):150-151. syn. nov.

*Aphalara polygoni*: Ossiannilsson, 1951, Soc. Sci. Fenn. Comm. Biol. 17(13):1-8.

*Aphalara calthae* (nec Linnaeus) + *Psylla artemisifoliae*: Sasaki, 1954, Sci. Rep. Mats. Agr. Coll. 14:29, 33.

*Aphalara polygoni*: Vondracek, 1957, Faun. CSR 9:145-147.

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- Aphalara polygoni*: Lindberg et Ossiannilsson, 1960, Faun. Fenn. 8:7.  
*Aphalara polygoni*: Loginova, 1961, Ent. Obozr. 40(3):612-615.  
*Aphalara polygoni* var. *rumicicola* + *A. P.* var. *herbicola*: Loginova, 1962a, Trudy zool. Inst. Akad. Nauk. 30:187.  
*Aphalara polygoni*: Loginova, 1962b. Ibid. 31:35.  
*Aphalara polygoni*: Dobreanu et Manolache, 1962, Faun. Rep. pop. Rom. Ins. 8(3): 89-93.  
*Aphalara polygoni*: Klimaszewski, 1963e, Ann. Zool. 21(8): 61.  
*Aphalara polygoni*: Klimaszewski, 1964c, Ibid. 22(6): 140.  
*Aphalara polygoni*: Loginova, 1964a, Keys Ins. Eur. USSR. 1:448.  
*Aphalara polygoni*: Loginova, 1966b, Trudy Mold. nauchn.-issl. Inst. 13:133.  
*Aphalara polygoni*: Klimaszewski, 1966b, Ann. Zool. 23(14) : 414.  
*Aphalara polygoni*: Klimaszewski, 1967c, Mitt. Zool. Mus. Berl. 43(1): 45-46.  
*Aphalara polygoni*: Klimaszewski, 1967d, Ann. Univ. Mar. Cur-Sklod. 21:2.  
*Aphalara polygoni*: Klimaszewski, 1968. Reichenbachia 11(20): 222.  
*Aphalara polygoni*: Klimaszewski, 1968, Ann. Zool. 25(8): 404.  
*Aphalara polygoni*: + *A.P.* var. *rumicicola*: Loginova, 1968, Trudy Vses, Ent. Obshch. 52: 284.  
*Aphalara polygoni*: Miyatake, 1969c, Bull Osaka Mus. Nat. Hist. 22:66.  
*Aphalara polygoni*: Klimaszewski, 1970a, Ann. Univ. Mar. Cur-Sklod. 24:216.  
*Aphalara polygoni*: Klimaszewski, 1970c, Ibid. 184: 228-229.  
*Aphalara polygoni*: Klimaszewski, 1971, Fragm. Faun. 17(7): 163.  
*Aphalara polygoni*: Kuwayama et Miyatake, 1971, Mushi 45(2): 52.  
*Aphalara polygoni*: Baba et Miyatake, 1971, Bull. Osaka Mus. Nat. Hist. 24: 7.  
*Aphalara polygoni*: Klimaszewski, 1973, Ann. Zool. 30(7): 166.  
*Aphalara polygoni*: Klimaszewski, 1975, Faun. Plosk. 3:81-83.  
*Aphalara polygoni*: Hodkinson, 1976a, Ent. Gaz. 27:123.  
*Aphalara polygoni*: Miyatake, 1976, Lif. Tsushima Is.: 489.  
*Aphalara polygoni*: Miyatake, 1979, Ins. Niigata Pref. 50:214.  
*Aphalara polygoni*: Hodkinson et White, 1979, Handb. Ident. Brit. Ins. 2(5a): 26.  
*Aphalara polygoni*: Hodkinson, 1980, Journ. Biog. 7:136.  
*Aphalara polygoni*: White et Hodkinson, 1982, Handb. Ident. Brit. Ins. 2(5b): 20.

**Type-locality:** Europe.

**Description:** General coloration dirty yellow with orange to ochreous markings on vertex and dorsum, with dark markings on venter.

Vertex about half as long as wide at median length, with deep discal impressions on posterior half. Antennae somewhat longer than width of head including eyes, with apical 2 segments dark to black.

Pronotum not exceeding width of head including eyes. Forewings elongate, widest in apical third, membrane rather hyaline with apical half slightly yellow in tint, termination of vein Culb with a dark spot on it. Hindtibia with 8 to 9 saltatorial spines at apex.

Male proctiger with horizontal processes rather short and broad. Parameres extended at dorsal margins of basal portions; apices with inner teeth narrowly separated, almost at level of straight apical margins. Aedeagus with shaft gently curved; neck slender; apex bent dorsad, broadly inflated, with tip narrow.

Female genitalia wedge shaped, shorter than wide. Proctiger longer than broad; length of anus shorter than remainder of proctiger. Subgenital plate nearly as long as proctiger, somewhat triangularly terminated in lateral view.

**Length:** Body male 1.5-1.7mm, female 1.7-1.9mm; to tip of folded wings male 2.3-2.7mm, female 2.6-3.0mm.

**Locality:** CN : Mt. Gyeryongsan.

GB : Daegu, Hayang Eub, Mt. Hwanghagsan, Mt. Juwangsan, Mt. Palgongsan.

GG : Suwon.

GN : Bangeojin, Samnam Myeon.

GW : Mt. Odaesan, Mt. Seolagsan.

JB : Mt. Naejangsan.

JN : Is. Daeheugsando, Mt. Mudeungsan.

**Distribution:** Korea (new record), Japan (Hokkaido, Honshu, Kyushu, Shikoku, Tsushima), China (Shansi), Europe, whole U.S.S.R., Himalaya.

**Host-plant:** *Polygonum* spp.

#### 6. *Aphalara itadori* (Shinji, 1938) (Allag-namui)

*Aphalara nebulosa* (nec Zetterstedt): Matsumura, 1916, Appl. Ent. 1:374, pl.14(6) (Korea).

*Aphalara nebulosa* (nec Zetterstedt): Matsumura, 1931, 6000 Ill. Ins. Jap. Emp.: 1274 (Korea).

*Psylla itadori*: Shinji, 1938a, Kontyu. 12(4): 149-150.

*Psylla itadori*: Shinji, 1944, Gall & Gall-Ins.: 445.

*Aphalara nebulosa* (nec Zetterstedt): Kuwayama, 1950, Icon. Ins. Jap. ed. sec.: 331.

*Aphalara nebulosa* (nec Zetterstedt): Sasaki, 1954, Sci. Rep. Mats. Agr. Coll. 14:30.

*Aphalara itadori*: Miyatake, 1964b, Bull. Osaka Mus. Nat. Hist. 17:20-21.

*Aphalara itadori*: Miyatake, 1965a, Icon. Ins. Jap. Col. nat ed. 3:147, pl.74 (1).

*Aphalara itadori*: Miyatake, 1965b, Kontyu 33(1): 172 (Korea).

*Aphalara itadori*: Miyatake, 1966, Ibid. 34(4): 327 (Korea).

*Aphalara itadori*: Miyatake, 1969c, Bull. Osaka Mus. Nat. Hist. 22:65 (Korea).

*Aphalara nebulosa* (nec Zetterstedt): Ko, 1969, List For. Ins. Pests Kor.: 24 (Korea).

*Craspedolepta nebulosa* (nec Zetterstedt): Miyatake, 1971a, Bull. Osaka Mus. Nat. Hist. 24:1.

*Aphalara itadori*: Baba et Miyatake, 1971, Ibid. 24:6.

*Aphalara nebulosa* (nec Zetterstedt): Kor. Soc. Pl. Prot., 1972, List Pl. Dis., Ins. Pests, & Weeds Kor.: 121 (Korea).

*Aphalara itadori*: Klimaszewski, 1973, Ann. Zool. 30(7): 165 (Korean Peninsula).

*Aphalara itadori*: Miyatake, 1977, Col. Ill. Ins. Jap. 2: 160-161, pl. 38(604).

*Aphalara itadori*: Miyatake, 1979, Ins. Niigata Pref. 50:213.

*Aphalara itadori*: Lee et Kwon, 1981, Rep. Kor. Ass. Cons. Nat. 19: 152<sup>D</sup>.

**Type-locality:** Japan.

**Description:** General coloration orange yellow to ochreous, with dark markings on venter and especially prominent on forewings.

Vertex about half as long as wide at median length, with longitudinally obliquely concave discal impressions on next to each center. Antennae slightly exceeding width of head including eyes, with apical two segments dark.

Pronotum about as wide as head including eyes. Forewings oval, widest in apical third, with broadly curved apical margin, about two times as long as broad; color pattern dark to black, forming oblique transverse band which conspicuously present in basal half and next to apex. Hindtibia with generally 10 to 11 saltatorial spines at apex.

Male proctiger shorter than subgenital plate, with horizontal processes well developed. Parameres long, extended at apices, with inner teeth widely separated from apical margins. Aedeagus greatly inflated at apex, with narrow neck; shaft somewhat straight.

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Female proctiger longer than subgenital plate, with apex less sharp and very slightly upturned; dorsal side somewhat simply straight; length of anus distinctly shorter than remainder of proctiger.

As far as I am aware, Matsumura (1916) erroneously listed the above species as the name of *Aphalara nebulosa* (nec. Zetterstedt) for the first time in Korea, the latter is indeed not represented in Far East Asia yet.

**Length:** Body male 1.6-1.9mm, female 2.3-2.4mm; to tip of folded wings male 2.7-2.8mm, female 3.1-3.4mm.

**Locality:** GB : Daegu, Mt. Palgongsan, Mt. Seolagsan, Is. Ulreung (= Is. Ulleungdo; Sadong, Naridong, Mt. Seonginbong, Bonglaepogpo)<sup>①</sup>, Unsu Myeon.

GG : Seoul, Suweon.

GN : Bangeojin, Busan, Mt. Gayasan, Samnam Myeon, Tongdosa Temple, Mt. Yeongchuisan.

**Distribution:** Korea, Japan (Hokkaido, Honshu, Kyushu, Shikoku, Ryukyus).

**Host-plant:** *Polygonum* spp.

**7. *Aphalara jungsukae* Kwon, sp. nov. (Jungsukallag-namui)**

**Description:** General coloration yellowish brown to ocher brown with dark markings.

Vertex slightly longer than half as long as wide at median length (ratio, 9:16), moderately incised anteriorly, produced dully in front of each side of median suture, with deep discal impressions located posterior half. Antennae a little shorter than width of head including eyes (ratio, 16:18), with apical two segments dark brown to black.

Forewings pale yellow, semitransparent, with irregular oblique yellowish brown to dark brown color pattern. Hindtibia with approximately 9 saltatorial spines at apex.

Male proctiger short, with a pair of long horizontal processes posteriorly which are somewhat straight, gently narrowed. Parameres with inner teeth short, very slightly separated from apical margins which are produced at posterior, half in lateral view. Aedeagus more or less straight; apical portion inflated with a sharp spine.

Female genitalia hardly exceeding as long as wide; length of anus very slightly less than remainder of proctiger.

**Length:** Body male 1.7mm, female 1.7mm; to tip of folded wings male 2.5mm, female 2.6mm.

**Type-examined:** Holotype male, Mt. Gajisan, GN, S. Korea, 7, VI, 1981, coll. Y.J. Kwon; paratypes: Mt. Daedunsan, JB, S. Korea, 1 male, 29, VI, 1980, coll. Y.J. Kwon; Mt. Obongsan, GW, C. Korea, 1 female, 17, V, 1981, coll. Y.J. Kwon; Mt. Palgongsan, GB, S. Korea, 1 male, 27, V, 1981, 1 female, 21, IV, 1982, same locality, coll. Y.J. Kwon; Mt. Juwangsan, GB, S. Korea, 3 females, 19, VII, 1981, coll. K.J. Kwon; Mt. Mudeungsan, JN, S. Korea, 1 male, 1 female, 26, VII, 1981, coll. Y.J. Kwon; Samnam Myeon, GN, S. Korea, 1 female, 21, III, 1982, on *Pinus rigida*, coll. Y.J. Kwon; Dansan Myeon, GB, S. Korea, 1 female, X, 1982, coll. Y.J. Kwon.

**Remark:** This new species is closely allied to *Aphalara fasciata* Kuwayama, 1908, but may be apparently distinguished from the latter by the shape of forewings and male genitalia.

**Host-plant:** Unknown.

**8. *Aphalara fasciata* Kuwayama, 1908 (Ddiddeuinallag-namui)**

*Aphalara fasciata* Kuwayama, 1908, Trans. Sapp. Nat. Hist. Soc. 2:153-154, pl. 3 (3,9).

- Aphalara fasciata*: Oshanin, 1910, Ann. Mus. Zool. St. Pet. 15: 188.  
*Aphalara fasciata*: Aulmann, 1913, Psyll. Cat.: 63.  
*Psylla tadeana* Shinji, 1938a, Kontyu 12(4): 148-149.  
*Psylla polygonifoliae* Shinji, 1942a, Ins. World 46(1): 4-5.  
*Psylla polygomifoliae* (sic): Shinji, 1944, Gall & Gall-Ins.: 446-447.  
*Aphalara fasciata*: Sasaki, 1954, Sci. Rep. Mats. Agr. Coll. 14:29.  
*Aphalara fasciata*: Miyatake, 1964b, Bull. Osaka Mus. Nat. Hist. 17: 20.  
*Aphalara fasciata*: Miyatake, 1965a, Icon. Ins. Jap. Col. nat. ed. 3:147, pl. 74(2).  
*Aphalara fasciata*: Miyatake, 1969c, Bull. Osaka Mus. Nat. Hist. 22: 65-66.  
*Aphalara fasciata*: Baba et Miyatake, 1971, Ibid. 24: 6-7.  
*Aphalara fasciata*: Klimaszewski, 1973, Ann. Zool. 30(7): 164-165.  
*Aphalara fasciata*: Miyatake, 1976, Lif. Tsushima Is.: 489.  
*Aphalara fasciata*: Miyatake, 1979, Ins. Niigata Pref. 50: 213.

**Type-locality:** Japan.

**Description:** General coloration dirty yellow to light brownish yellow, with ochreous markings on vertex and dorsum.

Vertex slightly exceeding half as long as wide at median length, with deep discal impressions on posterior half. Antennae longer than width of head including eyes, with apical 2 segments dark.

Pronotum slightly narrower than head including eyes. Mesosternum with dark markings. Forewings somewhat elongate, hyaline; apical portions with yellowish brown color pattern, forming irregular oblique transverse bands which are obscurely present. Dorsal side of abdomen dark brown. Hindtibia with usually 9 to 10 saltatorial spines at apex.

Male proctiger with horizontal processes very long, somewhat straight, well developed, nearly twice as long as proctiger. Parameres somewhat stout; inner teeth long, deeply separated from apical margins, with apices obliquely truncate. Aedeagus rather straight; apex oval with a sharp tip directed basad.

Female proctiger longer than subgenital plate; length of anus a little longer than remainder of proctiger.

**Length:** Body male 1.6-1.7mm, female 1.9-2.3mm; to tip of folded wings male 2.3-2.5mm, female 2.7-3.9mm.

**Locality:** GB : Daegu, Dansan Myeon, Mt. Naeyeonsan.  
 GN : Bangeojin, Mt. Geumsan, Samnam Myeon.  
 JN : Is. Daeheugsando.

**Distribution:** Korea (new record), Japan (Hokkaido, Honshu, Kyushu, Shikoku, Tsushima).

**Host-plant:** *Polygonum* spp.

Genus 6. *Craspedolepta* Enderlein, 1921 (Jeom-namui-sog)

*Craspedolepta* Enderlein, 1921, Zool. Anz. 52 (5): 118.

Type-species: *Aphalara artemisiae* Foerster, 1848

Type-locality: Germany.

Head somewhat depressed, generally exceeding twice as wide as long. Vertex incised mesally on anterior margin, with rather roundly produced anterior lobes, passing imperceptively into uniformly convex genae; median suture prominent; discal impressions present. Clypeus short, pillow shaped in frontal view, not markedly projecting from genae. Frons distinct, with a median

ocellus often scarcely visible from above. Antennae usually slightly exceeding width of head including eyes.

Forewings generally elongate with apical margins deeply rounded; membrane usually with numerous color spots and irregular patches, somewhat transparent or often slightly opaque; pterostigma entirely absent. Hindtibia with at most 9 saltatorial spines at apex; basal metatarsus armed with 2 saltatorial spines.

Male proctiger with long horizontal processes posteriorly, which mostly bearing a hook-like process curved innerward on ventral margin. Parameres more or less extending distally, with a prominent inner tooth. Aedeagus with apex greatly swollen and often overhanging to neck.

Female genitalia usually longer than wide.

Generally a large Holarctic genus associated with mostly plants of Compositae. In Korea 5 species occur.

#### Key to species of *Craspedolepta*

1. Largest species, 3.1-3.3mm in female total length, 2.7-2.9mm in male total length. Forewing length 2.50-2.65mm in female, 2.05-2.25mm in male . . . . . *C. flava*  
— Smaller species, less than 3.1mm in female total length, 2.7mm in male total length.  
Forewing length not more than 2.55mm in female, 2.15mm in male . . . . . 2.
2. Smallest species. Forewing length less than 1.6mm in male, 2.0mm in female. Male paramere with posterior margin somewhat rectangularly produced at median portion in lateral view . . . . . *C. conspersa*  
— Forewing length exceeding 1.6mm in male, 2.0mm in female. Male paramere without rectangularly produced posterior margin in lateral view . . . . . 3.
3. Forewing membrane with surface spinules in all cells, leaving broad spinule-free stripes along vein margins . . . . . *C. retracta*  
— Forewing membrane with surface spinules in all cells not leaving broad spinule-free stripes along vein margins . . . . . 4.
4. Forewing surface spinules arranged so as to form distinct network pattern in all cells, each mesh delimited by a row of spinules . . . . . *C. evaiana*  
— Forewing surface spinules not arranged in network pattern on apical portion, but densely and irregularly covering membrane . . . . . *C. chonsamri*

#### 9. *Craspedolepta flava* (Kuwayama, 1908) (Ogieom-namui)

*Aphalara flava* Kuwayama, 1908, Trans. Sapp. Nat. Hist. Soc. 2:154-155, pl.3 (4,10).

*Aphalara flava*: Oshanin, 1910, Ann. Mus. Zool. St. Pet. 15: 188.

*Aphalara flava*: Aulmann, 1913, Psyll. Cat.: 64.

*Aphalara flava*: Sasaki, 1954, sci. Rep. Mats. Agr. Coll. 14:30.

*Craspedolepta flava*: Loginova, 1966a, Trudy zool. Inst. Akad. Nauk. 37: 9-10.

*Craspedolepta flava*: Baba et Miyatake, 1971, Bull. Osaka Mus. Nat. Hist. 24: 7.

*Craspedolepta flava*: Klimaszewski, 1973, Ann. Zool. 30(7): 174.

*Craspedolepta flava*: Miyatake, 1979, Ins. Niigata Pref. 50: 214.

*Craspedolepta flava*: Park et al., 1980b, Nat. & Life 10(1): 9<sup>Q</sup>.

Type-locality: Japan.

Description: General coloration yellowish green, with olive green tints on dorsum.



Vertex prominently longer than half as long as wide at median length, bluntly produced on each side of apical margin; disc somewhat flat, with shallow discal impressions on each posterior half. Antennae prominently longer than width of head including eyes (ratio, 4:3), with apical segment dark.

Pronotum about as wide as head including eyes. Forewings elongate, yellowish subhyaline, with apical margins deeply round; vein Rs subparallelled with M, slightly arched; cell m2 bell-like, cell cu1 longer than m2. Hindtibia with approximately 7 to 8 saltatorial spines at apex.

Male proctiger shorter than subgenital plate; horizontal processes long, well developed. Parameres extended at distal half, with inner tooth not reaching apical margin.

Female genitalia very long; proctiger longer than subgenital plate; length of anus less than half as long as remainder of proctiger; apical portion of proctiger slender, with tip slightly upturned in lateral view.

**Length:** Body male 2.3-2.5mm, female 2.6-2.8mm; to tip of folded wings male 2.7-2.9mm, female 3.1-3.3mm.

**Locality:** GB : Hayang Eub, Jungdae (= Jeongdae vic. Daegu)<sup>①</sup>.

**Distribution:** Korea, Japan (Hokkaido, Honshu), U.S.S.R. (Maritime Territory).

**Host-plant:** *Artemisia* sp.

#### 10. *Craspedolepta conspersa* (Loew, 1888) (*Ssugjeom-namui*)

*Aphalara conspersa* Loew, 1888, Verh; zool.-bot. Ges. Wien. 38: 31.

*Aphalara conspersa*: Oshanin, 1907, Ann. Mus. Zool. St. Pet. 12: 345.

*Aphalara conspersa*: Aulmann, 1913, Psyll. Cat.: 63.

*Craspedolepta conspersa*: Loginova, 1966a, Trudy zool. Inst. Akad. Nauk. 37: 5-6.

*Craspedolepta conspersa*: Loginova, 1966b, Trudy Mold. nauch.-issl. Inst. 13: 134.

*Craspedolepta conspersa*: Miyatake, 1969c, Bull. Osaka Mus. Nat. Hist. 22: 66-67.

*Craspedolepta conspersa*: Baba et Miyatake, 1971, Ibid. 24: 7.

*Craspedolepta conspersa*: Klimaszewski, 1973, Ann. Zool. 30(7): 172.

*Craspedolepta conspersa*: Miyatake, 1979, Ins. Niigata Pref. 50: 214.

**Type-locality:** Germany.

**Description:** General coloration yellow green, with orange yellow tints on dorsum. Vertex distinctly longer than half as long as wide (ratio, 8: 13), deeply and roundly incised anteriorly, bluntly and dully produced in front of each side of median suture, with longitudinally concave discal impressions on posterior half, scattered with numerous white waxy scales on surface. Antennae longer than width of head including eyes (ratio, 29: 20), dark at apical three segments.

Forewings elongate, narrow basally, widest in apical third.

Male proctiger shorter than subgenital plate, with a pair of horizontal processes posteriorly which bearing prominent hairs on apices. Parameres slightly narrowed at next to basal portions, with posterior margins somewhat rectangularly produced at median portions in lateral aspect. Aedeagus long, with shaft slender; apex inflated with a sharp but short spine on dorsal end.

Female proctiger strikingly long; distal half much slender and narrow.

**Length:** Body male 1.3-1.4mm, female 1.9-2.0mm, to tip of folded wings male 2.0-2.1mm, female 2.5-2.7mm.

**Distribution:** Korea (new record), Japan (Honshu), Bulgaria, Rumania, U.S.S.R. (Moldavia).

**Host-plant:** *Artemisia* sp.

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11. *Craspedolepta retracta* Klimaszewski, 1968 (Myohyangjeom-namui)

*Craspedolepta retracta* Klimaszewski, 1968a, Bull. Acad. Pol. Sci. Cl. 2, 16(5): 287<sup>Ⓛ</sup>

*Craspedolepta retracta*: Miyatake, 1971a. Bull. Osaka Mus. Nat. Hist. 24: 1 (Korea).

*Craspedolepta retracta*: Klimaszewski, 1973, Ann. Zool. 30 (7): 180 (Korean Peninsula).

Type-locality: Korea.

Description: General coloration green, with ochreous yellow pattern on head and thorax. Head including eyes about 0.58mm wide. Vertex prominently exceeding half as long as wide at median length, 0.36mm in width, 0.22mm in length; median suture deep, darker than other part.

Forewings elongate, exceeding 2 times as long as wide, deeply rounded at apical margins, broadest near middle; about 2.08mm long and 0.82mm wide in holotype; membrane slightly subhyaline, scattered with numerous dark brown spots, which irregularly fused each other so as to forming cloud patches on distal portions; veins pale yellow, vein Rs rather straight, with only terminal portion bent upward; cell cul nearly as long as m<sub>2</sub>; quotient of cul about 2 versus 1; surface spinules relatively dense, somewhat regularly distributed in all cells, leaving broad spinule-free bands along margins of veins.

Hitherto only female has been known, the male genitalic structure is still unknown state.

Length: Body female 1.8-2.0mm; to tip of folded wings female 2.5-2.7mm.

Locality: PB : Songun-ri distr. Samsol (= vic. Gujang)<sup>Ⓛ</sup>.

Distribution: Korea.

Host-plant: Unknown.

12. *Craspedolepta evaiana* Klimaszewski, 1963 (Cheongjinjeom-namui)

*Craspedolepta evaiana* Klimaszewski, 1963d, Bull. Acad. Pol. Sci. Cl. 2, 11(11): 541-543<sup>Ⓛ</sup>.

*Craspedolepta evaiana*: Miyatake, 1971a. Bull. Osaka Mus. Nat. Hist. 24:1 (Korea).

*Craspedolepta evaiana*: Klimaszewski, 1973, Ann. Zool. 30(7): 174 (Korean Peninsula).

Type-locality: Korea

Description: General coloration green, with pale yellow or yellowish brown patches on head and thorax.

Antennae yellowish, sometimes yellowish brown, with apices somewhat dark.

Forewings elongate, apical margins deeply rounded; membrane with inner half of spinule-area milky white along veins M + Cul, Cul, Cula, Culb, and M<sub>1+2</sub>; distal portion of vein M and apex of Rs yellowish brown; surface spinules arranged so as to forming distinct network pattern in all cells, each mesh delimited by a row of spinules.

Male proctiger slightly shorter than subgenital plate, with horizontal processes tapered to apices. Parameres extended at bases and apical portions; inner teeth somewhat stout; tips truncate, not reaching apical margins. Aedeagus with distal segment cylindrical, rather straight; apex elongately extended, bearing ventral and dorsal processes.

Female proctiger longer than subgenital plate, with slender apex.

Length: Body male 1.6-1.8mm, female 1.9-2.0mm; to tip of folded wings male 2.3-2.5mm, female 2.5-2.7mm.

Locality: HB : Onpho ad Tschongdschin (= Onpo near Cheongjin)<sup>Ⓛ</sup>.

Distribution: Korea.

Host-plant: Unknown.

13. *Craspedolepta chonsamri* Klimaszewski, 1968 (Weonsanjeom-namui)

*Craspedolepta chonsamri* Klimaszewski, 1968a, Bull. Acad. Pol. Sci. C1. 2. 16(5): 286-287<sup>①</sup>.

*Craspedolepta chonsamri*: Miyatake, 1971a, Bull. Osaka Mus. Nat. Hist. 24: 1 (Korea).

*Craspedolepta chonsamri*: Klimaszewski, 1973, Ann. Zool. 30(7): 172 (Korean Peninsula).

Type-locality: Korea.

**Description:** General coloration green, with irregular yellowish white streaks on head and thorax.

Head width about 0.59mm in male, 0.65mm in female. Vertex distinctly exceeding half as long as wide at median length. Antennae pale yellowish white or yellow; 9th and 10th segments brownish black, longer than width of head including eyes, about 0.82-0.5mm in female.

Forewings elongate, exceeding twice as long as wide, scattered with numerous brown spots; cell cul longer than m<sub>2</sub>; surface spinules not arranged in network pattern on apical portion, but densely and irregularly covering membrane. Abdomen green; each segmental margin light, greenish yellow.

Male proctiger 0.23mm high; horizontal processes about twice as long as height of proctiger. Subgenital plate somewhat longer than wide. Parameres 0.3mm long, with apical portions laminately extended; inner teeth short, not reaching apical margins. Aedeagus with shaft somewhat straight, cylindrical, apex bluntly and roundly inflated.

Female proctiger 0.85mm long; dorsal margin wavy meander in lateral aspect.

**Length:** Body male 1.8-2.0mm, female 2.0-2.2mm; to tip of folded wings male 2.5-2.8mm, female 2.9-3.1mm.

**Locality:** HN : Chonsam-ri 10km S Vonsan (= vic. Weonsan)<sup>①</sup>.

**Distribution:** Korea.

**Host-plant:** Unknown.

Family III. PSYLLIDAE Burmeister, 1835 (Namui-gwa)

Head moderately deflexed, usually as broad as thorax, distinctly separated from thorax; pre-occipital lobes usually absent. Vertex much shorter than broad, with discal impressions usually prominent. Genal cones generally conspicuously developed, or very rarely reduced. Frons usually greatly reduced and enveloped between bases of genal cones, with median ocellus visible in dorsal view. Eyes strikingly convex, approximately spherical, extending well beyond lateral extremities of post-orbital ridges. Antennae varied; 2nd segment narrower than 1st one and shorter than 3rd one.

Forewings usually membranous, or rarely thick, with pterostigma present or absent; gap of anal vein always adjacent to apex of vein Culb; veins Cul and M having common stem arising from R; surface spinules present or absent.

Male proctiger simple tubular or broad subtriangularly extending posteriorly, without horizontal processes. Parameres and aedeagus varied.

Female genitalia usually wedge shaped, but varied in length.

Generally a very large family of cosmopolitan distribution, feeding on various trees and shrubs, hitherto containing more than 275 species belonging to 18 genera under 5 subfamilies in Palaearctic Region. In Korea 43 species belonging to 6 genera under 5 subfamilies are represented. Recent studies have brought out substantial alternations in previous system, and many taxa

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were changed and placed into the modern category, even some well-known groups were excluded out to other families, mainly by the efforts of Loginova, Hodkinson, and Bekker-Migdisova.

Key to subfamilies of Korean Psyllidae

1. Vein Rs of forewing branched into three to five distally, connected with  $M_{1+2}$  ..... *Ciriacreminae*  
— Vein Rs of forewing not branched, separately stretched with  $M_{1+2}$  ..... 2.
2. Veins of forewing strongly bisinuate. Pleural suture of prothorax extending to middle of lateral extremity of pronotum ..... 3.  
— Veins of forewing slightly sinuate. Pleural suture of prothorax extending obliquely to posterior part of lateral extremity of pronotum, or not attaining to it at all ..... 4.
3. Genal cones large and flat, slightly divergent. Antennae longer than head width including eyes, with basal 2 segments moderately broad and distinctly shorter than remainder. Basal metatarsus with a pair of prominent saltatorial spines ..... *Euphalerinae*  
— Genal cones very small and more or less reduced, strongly divergent. Antennae short, not exceeding head width including eyes, with basal 2 segments broad and fully as long as remainder. Basal metatarsus without saltatorial spines ..... *Metapsyllinae*
4. Propleurites usually rectangular and of equal size. Hindtibia with 4 to 5 saltatorial spines at apex; basal metatarsus with 1 or 2 saltatorial spines of very rarely absent. Male parameres with apices extended or narrowed ..... *Arytaininae*  
— Propleurites unequal. Hindtibia with 5 to 7 saltatorial spines at apex; basal metatarsus with 2 saltatorial spines laterally. Male parameres with apices narrowed ..... *Psyllinae*

Subfamily CIRIACREMINAE Crawford, 1914 (Bbong-namui-agwa)

Head usually as broad as thorax. Vertex much shorter than wide, with discal impressions usually present. Genal cones well developed but generally shorter than vertex. Frons often reduced and enveloped between bases of genal cones, bearing median ocellus clearly visible from above. Eyes strongly convex, approximately spherical, extending well beyond lateral extremities of post-orbital ridges; ocular sclerite often visible to forming minute pre-occipital lobes between eye and antennal socket. Antennae often slender, exceeding width of head including eyes.

Thorax strongly arched and inflated dorsally. Forewings usually thick, ovate or often rhomboidal, with pterostigma present; vein Rs branched apically and connected with  $M_{1+2}$ , or sending a short cross vein to form a marginal cell.

Hindtibia often with a spine at base behind.

Male genitalia varied; proctiger with or without broad processes posteriorly.

Female genitalia long, rarely as long as broad.

A rather smaller group widely distributed in Oriental, Australian, Nearctic, Ethiopian, and in Far East Asian Regions. In Palaearctica only one genus with single species has been known.

Genus 7. *Anomoneura* Schwarz, 1896 (Bbong-namui-sog)

*Anomoneura* Schwarz in Uhler, 1896, Proc. U.S. Nat. Mus. 19:295-296.

Type-species: *Anomoneura mori* Schwarz, 1896

Type-locality: Japan.

Head including eyes wider than prothorax, about as wide as mesothorax. Vertex about 2 times as wide as long, with discal impressions present. Genal cones prominent, broad at base. Frons enveloped between bases of genal cones, with median ocellus prominent. Eyes strongly convex, somewhat spherical, with ocular sclerite visible to form small narrow pre-occipital lobes between eye and antennal socket. Antennae slender, exceeding width of head including eyes.

Forewings somewhat rhomboidal, very slightly thick and broad, with pterostigma present; vein Rs branched into three to five distally, and connected with  $M_{1+2}$  to form several marginal cells. Hindtibia with a spine at knee; apical saltatorial spines generally arranging 4+1; basal metatarsus with 2 saltatorial spines.

Male proctiger without process on posterior margin. Aedeagus slender.

Female genitalia longer than broad.

Monotypic genus, only limiting Far East Asia. Klimaszewski (1963b) described *Anomoneura koreana* based on the single female material from Keumkang Mts. (= Mt. Geumgangsan), Central Korea, but he failed to reveal differences between the type-species and the former which now treats as a junior synonym.

#### 14. *Anomoneura mori* Schwarz, 1896 (Bbong-namui)

*Anomoneura mori* Schwarz in Uhler, 1896, Proc. U.S. Nat. Mus. 19: 296-297.

*Anomoneura mori*: Oshanin, 1907, Ann. Mus. Zool. St. Pet. 12: 369.

*Anomoneura mori*: Kuwayama, 1908, Trans. Sapp. Nat. Hist. Soc. 3: 63-64, pl. 2 (1,7).

*Anomoneura mori*: Aulmann, 1913, Psyll. Cat.: 81.

*Anomoneura mori*: Matsumura, 1916, Appl. Ent. 1: 369-370.

*Anomoneura mori*: Matsumura, 1931, 6000 Ill. Ins. Jap. Emp.: 1275.

*Anomoneura mori*: Shinji, 1944, Gall & Gall-Ins.: 453.

*Anomoneura mori*: Kuwayama, 1950, Icon. Ins. Jap. ed. sec.: 330.

*Anomoneura mori*: Sasaki, 1954, Sci. Rep. Mats. Agr. Coll. 14: 32.

*Anomoneura koreana* Klimaszewski, 1963b, Bull. Acad. Pol. Sci. C1.2. 11(2): 92-94<sup>①</sup>.

*Anomoneura mori*: Chon, 1963, Jamsabo 10(6): 74-75 (Korea).

*Anomoneura mori*: Chon, 1964, Ser. Journ. Kor. 4: 33-39 (Korea).

*Anomoneura mori*: Miyatake, 1964b, Bull. Osaka Mus. Nat. Hist. 17: 24.

*Anomoneura mori*: Miyatake, 1965a, Icon. Ins. Jap. Col. nat. ed. 3: 147, pl. 74 (8).

*Anomoneura mori*: Miyatake, 1969c, Bull. Osaka Mus. Nat. Hist. 22: 68.

*Anomoneura mori*: Ko, 1969, List For. Ins. Pests Kor.: 24 (Korea).

*Bbongnamui*: Kim et al., 1970, Res. Bull. Ser. Exp. Stat. Kor.: 265.

*Anomoneura mori* + *A. koreana*: Miyatake, 1971a, Bull. Osaka Mus. Nat. Hist. 24: 1 (Korea).

*Anomoneura mori*: Kor. So. Pl. Prot., 1972, List Pl. dis., Ins. Pests & Weeds Kor.: 121 (Korea).

*Anomoneura koreana* + *A. mori*: Klimaszewski, 1973, Ann. Zool. 30(7): 190 (Korean Peninsula).

*Anomoneura mori* + *A. koreana*: Klimaszewski, 1975, Faun. Polsk. 3: 26 (Korea).

*Anomoneura mori*: Miyatake, 1976, Lif. Tsushima Is.: 490 (Korea).

*Anomoneura mori*: Miyatake, 1977, Col. Ill. Ins. Jap. 2: 161, pl. 38 (607) (Korea).

*Anomoneura mori*: Okuno et al., 1977, Dis. & Pests Cult. trees & Shrubs Col.: 59, pl. 15(110).

*Anomoneura mori*: Miyatake, 1979, Ins. Niigata Pref. 50: 214.

*Anomoneura mori*: Ed. Dep. Hokuryukan, 1979, Ill. Ins. Jap. Stud. ed.: 92 (Korea).

*Anomoneura mori* + *A. koreana*: Park et al., 1980b, Nat. & Life 10(1): 8-9<sup>①</sup>.

*Anomoneura mori*: Park et Lee, 1980c, Nat. & Life 10(2): 19-24 (Korea).

*Anomoneura mori*: Lee et Kwon, 1981, Rep. Kor. Ass. Cons. Nat. 19: 152<sup>②</sup>.

Type-locality: Japan.

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**Description:** General coloration pale yellowish green to pale ocher, or dirty yellowish brown; dorsum with faint yellowish markings.

Vertex shorter than half as long as wide, obliquely truncate anteriorly and slightly triangularly produced. Genal cones slightly shorter or nearly as long as vertex mesally, obtusely triangular, divergent apically. Antennae long, almost 2 times as long as width of head including eyes.

Forewings somewhat transparent, scattered with numerous irregular brown spots, with veins pale ocher or reddish brown; Rs with 3 to 5 branches, extremely irregular in each specimen.

Male proctiger rather stout, meanderly narrowed to apex. Parameres somewhat straight, bluntly narrowed at apices which are bent entad forming processes. Aedeagus slender distally, with broad base; apex slightly inflated.

Female proctiger longer than subgenital plate, with dorsal margin somewhat wavy in lateral aspect; length of anus nearly half as long as remainder of proctiger.

As already indicated out by Miyatake (1969c), the forewing venation is greatly varied. This species is one of the most serious pests of sericulture in Korea.

Their population is strikingly great in Is. Ulleungdo where their host plant-mulberry trees are relatively abundant wildly, and the adults even attack and feed on *Pinus thunbergi*, *Cryptomeria japonica*, *Camellia japonica*, and *Machilus thunbergi*.

**Length:** Body male 2.5-2.8mm, female 3.4-3.5mm; to tip of folded wings male 4.0-4.3mm, female 4.4-4.6mm.

**Locality:** CB : Cheongweon<sup>②</sup>, Danyang, Mt. Soglisán

CN : Mt. Gyeryongsan, Yesan<sup>③</sup>.

GB : Daegu, Dansan Myeon, Dasan Myeon, Geumleung<sup>④</sup>, Gyeongju, Mt. Hwanghagsan, Mt. Palgongsan, Mt. Sansungsan (= Mt. Sanseongsan vic. Daegu)<sup>⑤</sup>, Is. Ulreung (= Is. Ulleungdo; Dodong, Jeodong, Sadong, Cheonbudong, Naridong, Albongbunji, Chusan, Mt. Seonginbong, Bonglaepogpo)<sup>⑥</sup>, Unsu Myeon, Yangnam Myeon, Yecheon<sup>⑦</sup>.

GG : Gwangleung, Mt. Myeongjisan, Seoul, Suweon, Yeosu<sup>⑧</sup>

GN : Busan, Mt. Gajisan, Mt. Gayasan, Is. Geoje, Mt. Geumsan, Masan, Milyang<sup>⑨</sup>, Samnam Myeon, Tongdosa Temple, Ulsan, Mt. Weonhyosan.

GW : Chunseong<sup>⑩</sup>, Keumkang Mts. (= Mt. Geumgangsán)<sup>⑪</sup>, Mt. Obongsan, Mt. Odaesan, Pyeongchang<sup>⑫</sup>, Mt. Seolagsan.

JB : Mt. Mayisan, Mt. Naejangsan, Mt. Unjangsan.

JN : Mt. Mudeungsan, Seungju<sup>⑬</sup>, Is. Wando.

**Distribution:** Korea, Japan (Hokkaido, Honshu, Kyushu, Shikoku, Tsushima).

**Host-plant:** *Morus bombycis*, *M. alba*.

Subfamily EUPHALERINAE Bekker-Migdisova, 1973 (Juieom-namui-awa)

Head somewhat subvertical, usually as wide as thorax, distinctly broader than long. Vertex flat and large, discal impressions present. Genal cones well developed, usually on same plane as vertex, often depressed and broad, contiguous or slightly divergent. Frons reduced, enveloped between bases of genal cones, bearing median ocellus prominent. Eyes large, strongly convex, without pre-occipital lobes between eye and antennal socket. Antennae usually short, or rarely long.

Thorax strikingly convex, broad, with surface of dorsum generally punctate; Pronotum subvertical, scarcely extending to pleural sides; propleurites usually equal in length dorsally, suture terminating at middle of lateral margin of pronotum. Forewings usually broad, rhomboidal or

oval; pterostigma generally well developed; veins often strongly bisinuate. Legs relatively short; hindtibia armed with 4 to 9 saltatorial spines at apex; basal metatarsus with 2 saltatorial spines.

Male proctiger without posterior process, more or less tubular. Female genitalia wedge shaped.

This subfamily is entirely separated from Atrytaininae by the forewing and thorax structure, as already indicated by Loginova (1976a), and it seems inevitable to erect the subfamily status. Generally a small group containing the single genus, represented from America, India, and Far East Asia.

#### Genus 8. *Euphalerus* Schwarz, 1904 (Juieom-namui-sog)

*Euphalerus* Schwarz, 1904, Proc. Ent. Soc. Wash. 6:238.

Type-species: *Euphalerus nidifex* Schwarz, 1904.

Type-locality: U.S.A.

Head generally subvertical, as wide as or rarely a little narrower than thorax. Vertex flat, distinctly broader than long. Genal cones large, somewhat flat, usually on same plane as vertex, roundly terminate, or more or less truncate apically, contiguous or slightly divergent. Frons reduced, bearing median ocellus between bases of genal cones prominent. Antennae generally less than 1.5 times as long as width of head including eyes.

Thorax strongly convex, with pronotum subvertical; propleural suture extending to middle of lateral extremity of pronotum. Forewings broad, rhomoidal or oval; pterostigma usually well developed; membrane more or less transparent, rarely subopaque, often with markings; veins often strikingly bisinuate. Hindtibia with or without genual spine, armed with 4 or 6 to 9 saltatorial spines at apex.

Basal metatarsus with 2 saltatorial spines laterally.

Male proctiger more or less tubular. Parameres varied. Aedeagus with distal segment usually not bent; apex variously swollen. Female genitalia wedge shaped; proctiger subtriangular in lateral shape.

In Palaearctica only 2 species are represented. The following single species has been known in Korea.

#### 15. *Euphalerus robinae* (Shinji, 1938) (Juieom-namui)

*Metapsylla robinae* Shinji, 1938a, Kontyu 12(4): 147-148.

*Metapsylla robinae*: Shinji, 1944, Galls & Gall-Ins.: 442-443.

*Metapsylla robinae*: Sasaki, 1954, Sci. Rep. Mats. Agr. Coll. 14:33.

*Metapsylla robinae*: Klimaszewski, 1973, Ann. Zool. 30(7): 196.

*Euphalerus robinae*: Miyatake, 1973, Bull. Osaka Mus. Nat. Hist. 27:24.

*Euphalerus robinae* (sic): Park et al., 1980b, Nat. & Life 10(1): 14-15<sup>①</sup>.

Type-locality: Japan.

**Description:** General coloration ochre brown to dark brown. Vertex lighter in tint, flat, with shallow discal impressions on each side of median suture. Genal cones yellowish green to yellowish brown, rather broad, somewhat quadrate, on same plane with vertex, with long pubescence; apical margins more or less obliquely truncate, concave on each center, thus forming 2 tubercles. Antennae yellowish brown, with apex of each segment and last one dark.

Forewings transparent, mottled with brown or dark apical marginal bands interrupted near

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apices of Cu<sub>2</sub>; veins with dark spots rather regularly; M<sub>1+2</sub> relatively short, 1.3 times as long as M<sub>3+4</sub>.

Male proctiger longer than subgenital plate, nearly parallel-sided in lateral aspect, obliquely truncate at apex. Parameres broad at base; anterior margin narrowed to apices; apical margin obliquely truncated. Aedeagus roundly thickened at apical two-fifths of upper margin.

Female proctiger slightly longer than subgenital plate, with apex dully pointed; length of anus distinctly shorter than remainder of proctiger.

**Length:** Body male 1.6-1.7mm, female 1.7-1.8mm; to tip of folded wings male 2.5-2.7mm, female 2.7-2.8mm.

**Locality:** GB : Songrimsa Temple (= Songlimsa Temple, vic. Daegu)<sup>①</sup>.

JB : Mt. Daedunsan.

**Distribution:** Korea, Japan (Honshu).

**Host-plant:** *Gleditsia japonica*.

Subfamily METAPSYLLINAE Kwon, subfam. nov. (Songyang-nami-agwa)

Head somewhat subvertical, distinctly wider than long, usually narrower than thorax. Vertex generally subquadrate, often exceeding half as long as wide, with discal impressions present rather posteriorly. Genal cones very small, more or less reduced, strikingly divergent apically, scarcely exceeding half as wide as anterior margin of vertex at base. Frons reduced, only slightly and narrowly visible around median ocellus which prominent, enveloped between bases of genal cones. Eyes convex, extending well beyond lateral extremities of post-orbital ridges, without ocular sclerites between eye and antennal socket. Antennae short, less than width of head including eyes, with basal 2 segments greatly inflated, and bearing 2 apical setae very long and greatly developed.

Thorax broad, strikingly convex. Forewings usually broad and ovate, thick and somewhat coriaceous, generally opaque, with pterostigma long; veins relatively broad in diameter, greatly bisinuate; C+Sc thickened. Legs with tibiae strongly swollen; hindtibia without genual spine at base; basal metatarsus without saltatorial spines laterally.

Male proctiger without posterior processes. Aedeagus with distal segment usually bent at middle; apex not greatly inflated. Female genitalia wedge shaped.

The present new subfamily is peculiar in external structure as well as in male genitalic character. The shape of antennae and aedeagus seems related to those of Calophyinae (recently transferred into the family Carsidaridae), considering the former being typically short and basal 2 segments swollen, each segment of flagellum markedly short, bearing with 2 long apical setae well developed, and the latter being somewhat flat and broad laterally, distal segment more or less bent or slightly constricted at middle, with apex not markedly or typically inflated on upper side, but evenly roundly terminated. Loginova (1976a) was the first who excluded the genus *Metapsylla* from the previously included subfamily Aryaninae in her revisional work on the latter, and she also asserted that the genus does not belong to this family at all without giving any certain taxonomic position. But it is my opinion even though this subfamily may be seen superficially peculiar and entirely different from the element of the family Psyllidae, it would be more appropriate place this new subfamily into the above family, till the exploration of extensive nymphal stage. It seems further retaining several structural similarity and relationship coming near to Calophyinae noted as above including basal metatarsal characters of which the saltatorial spines lacking entirely.

Containing single genus hitherto restricted in Korea, Japan, and Taiwan.



Genus 9. *Metapsylla* Kuwayama, 1908 (Songyang-namui-sog)

*Metapsylla* Kuwayama, 1908, Trans. Sapp. Nat. Hist. Soc. 2:157.

Type-species: *Metapsylla nigra* Kuwayama, 1908

Type-locality: Japan.

Head small, usually narrower than thorax. Vertex subquadrate, usually exceeding half as long as wide. Genal cones very small and short, strikingly divergent apically, pubescent, scarcely exceeding half as wide as anterior margin of vertex at base. Frons reduced, with median ocellus prominent, enveloped between bases of genal cones. Antennae very short, not exceeding width of head including eyes; basal 2 segments greatly swollen and fully as long as flagellum, with 2 apical setae nearly of the same length.

Thorax broad, strongly convex, not pubescent. Forewings broad, ovate, more or less rounded apically, thick and somewhat coriaceous, usually opaque, with irregular markings; pterostigma distally long; veins greatly bisinuate, C+Sc broadly thickened; marginal cells large. Hindtibia usually armed with 5 to 6 saltatorial spines at apex; basal metatarsus without saltatorial spines.

Male proctiger tubular, stout, longer than parameres. Parameres short, with an anterior lobe produced at apex. Aedeagus broad and flat laterally, with distal segment bent near middle; apex evenly roundly terminated.

Female genitalia usually scarcely exceeding as long as wide.

Only 3 species have been recorded, in Korea single one occurs.

#### 16. *Metapsylla nigra* Kuwayama, 1908 (Songyang-namui)

*Metapsylla nigra* Kuwayama, 1908, Trans. Sapp. Nat. Hist. Soc. 2:157-158, p1.3 (12,18).

*Metapsylla nigra*: Oshanin, 1910, Ann. Mus. Zool. St. Pet. 15.

*Metapsylla nigra*: Aulmann, 1913, Psyll. Cat.: 7.

*Metapsylla nigra*: Kuwayama, 1922, Ins. World 26:372.

*Metapsylla nigra*: Kuwayama, 1939, Zool. Mag. 51(7): 535-536.

*Metapsylla nigra*: Kuwayama, 1950, Icon. Ins. Jap. ed. sec.: 328.

*Metapsylla nigra*: Sasaki, 1954, Sci. Rep. Mats. Agr. Coll. 14:32-33.

*Metapsylla nigra*: Miyatake, 1963, Journ. Fac. Agr. Kyushu Univ. 12(4): 326-328.

*Metapsylla nigra*: Miyatake, 1965a, Icon. Ins. Jap. Col. nat. ed. 3: 147, p1. 74(10).

*Metapsylla nigra*: Klimaszewski, 1973, Ann. Zool. 30 (7): 195.

*Metapsylla nigra*: Park et al., 1980b, Nat. & Life 10 (1): 14<sup>①</sup>.

Type-locality: Japan.

**Description:** General coloration yellowish brown to ocher brown with dark brown markings.

Vertex somewhat flat, slightly half as long as wide. Genal cones yellowish brown, very small and short, strongly divergent. Eyes dark brown to black. Antennae yellowish brown, short, nearly as long as width of head including eyes; basal 3 segments prominently large, inflated; apical setae long, well developed.

Forewings ovate, posteroapical margins somewhat obliquely rounded, scattered with brown to dark irregular markings; veins strongly bisinuate.

Male proctiger stout, broad at base, narrowed to apex. Parameres relatively short and broad, distinctly shorter than proctiger, diagonally truncate at apices; anterior apical ridge produced. Aedeagus somewhat broad laterally; distal segment angularly bent near middle, with gently rounded apex; proximal segment slightly and evenly curved.

Female proctiger somewhat right-angled triangular, with abruptly narrowed and slightly up-

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turned apex; length of anus nearly half as long as remainder of proctiger.

**Length:** Body male 2.2-2.6mm, female 2.7-3.0mm; to tip of folded wings male 2.9-3.1mm, female 3.1-3.3mm.

**Locality:** GB : Pagaesa Temple (= Pagyesa Temple vic. Daegu)<sup>①</sup>.  
JJ : Mt. Hanlasan.

**Distribution:** Korea, Japan (Kyushu, Shikoku).

**Host-plant:** *Ehretia ovalifolia*.

#### Subfamily ARYTAININAE Crawford, 1914 (Jagui-namui-agwa)

Head usually as wide as thorax. Vertex distinctly broader than long, with discal impressions prominent. Genal cones broad at base, rudimental or well developed, straight or convex on outer side, most often blunt apically, with their bases not meeting on the frons. Frons reduced, enveloped between bases of genal cones, or clearly visible as a small sclerite between genae, bearing prominent median ocellus. Antennae usually long and slender, or rarely short.

Thorax convex; propleural suture longitudinal, located more or less in the middle, straight or slightly arcuate, arising from apex of pronotal lobe. Propleurites somewhat rectangular, of equal size, their height equal or often exceeding their total width at pronotum. Forewings usually membranous, often with markings; pterostigma present or absent; vein R equal to or often shorter than R+Rs, which is twice or exceeding twice as long as M+Cu1. Hindtibia with a genual spine at base, armed with 4 or 5 saltatorial spines at apex; basal metatarsus with 1 or 2 saltatorial spines or rarely absent.

Male proctiger usually simple. Aedeagus often with apical margin curved downward, varying in extent of its inflation.

Female genitalia wedge shaped.

Recently revised by Loginova (1976a, 1977), world widely distributed feeding on legumes, consisting of 11 genera under 2 tribes.

#### Key to genera of Aryaninae

1. Genal cones distinctly shorter than vertex, bluntly tuberculate, or rarely rudimental. Forewings with stem of Cu1 usually shorter than Culb. Male proctiger with subtriangular lobes posteriorly . . . . . *Acizzia*  
— Genal cones shorter than or of same length as vertex, usually conical. Forewings with stem of Cu1 usually longer than Culb. Male proctiger simple tubular, without lobes, only slightly broadened in lower half of posterior margin . . . . . *Cyamophila*

Genus 10. *Acizzia* Heslop-Harrison, 1961 (Jagui-namui-sog)

*Acizzia* Heslop-Harrison, 1961, Ann. Mag. Nat. Hist. 3(13); 417-418.

Type-species: *Psylla acaciae* Maskell, 1894

Type-locality: Australia.

*Neopsylla* Heslop-Harrison, 1949, Ent. Monthl. Mag. 85:161-162 nom. praec.

Type-species: *Psylla acaciae* Maskell, 1894

Type-locality: Australia.

Head short, wider than prothorax, about as long as or slightly wider than mesothorax. Vertex arcuate along anterior margin, with discal impressions present. Genal cones shorter than vertex, bluntly tuberculate, not meeting or barely meeting basally, rarely rudimental and slightly inflated beneath genae into 2 small conical processes. Frons usually small, almost entirely occupied by median ocellus, or rarely visible as a distinct small sclerite between genae forming bottom of a groove between them, with median ocellus prominent at apex. Clypeus short or rarely prominent. Eyes strongly convex, without preocular sclerites. Antennae short to very long and slender.

Forewings membranous; pterostigma and costal gap present; stem of Cu1 usually shorter than Culb; radular spinules generally prominent. Hindtibia with 4 to 5 saltatorial spines at apex; basal metatarsus with 1 or 2 saltatorial spines laterally.

Male proctiger with subtriangular lobes posteriorly, and very rarely also with an apical digitiform process on the lobes. Parameres and aedeagus varied.

Female genitalia wedge shaped and varied in length.

Trophically associated with plants of *Acacia* and *Albizzia*, belonging to Mimosaceae. Generally confined to the tropical and subtropical regions of the world, excepting 2 species which represented in Korea and Japan - the temperate zone. Hitherto 21 species are placed in the genus worldwide by Loginova (1977), Hodkinson et White (1980), and burckhardt (1981).

#### Key to species of *Acizzia*

1. Genal cones rudimental. Frons clearly visible as a small sclerite, bearing median ocellus prominent at apex. Antennae about twice as long as width of head including eyes. Male proctiger shorter than parameres . . . . . *A. sasakii*
- Genal cones prominent, broad at base, more or less divergent apically. Frons rudimental, almost entirely occupied by median ocellus. Antennae distinctly shorter than 1.5 times as long as width of head including eyes. Male proctiger longer than parameres . . . . . *A. jamatonica*

#### 17. *Acizzia sasakii* (Miyatake, 1963) (Keunjagui-namui)

*Psylla sasakii* Miyatake, 1963, Journ. Fac. Agr. Kyushu Univ. 12(4): 331-334.

*Psylla sasakii*: Miyatake, 1969c, Bull. Osaka Mus. Nat. Hist. 22:70-71.

*Psylla sasakii*: Baba et Miyatake, 1971, Ibid. 24:8.

*Psylla sasakii* (sic): Klimaszewski, 1973, Ann. Zool. 30(7):224.

*Psylla sasakii*: Miyatake, 1976, Lif. Tsushima Is.: 490.

*Acizzia sasakii*: Loginova, 1977, Ent. Rev. 56(3):64.

*Psylla sasakii*: Miyatake, 1979, Ins. Niigata Pref. 50:215-216.

*Psylla sasakii* (sic): Park et al., 1979, Nat. & Life 9(2):109<sup>①</sup>.

*Psylla sasakii*: Park et al., 1980b, Ibid. 10(1):11-12<sup>②-⑤</sup>.

**Type-locality:** Japan.

**Description:** General coloration greenish brown to olive with olive-green markings on dorsum and vertex.

Vertex distinctly shorter than half as long as wide. Rudiment of genal cones bearing with a pair of long, stout setae and distinctly pubescent. Antennae very long and slender, almost twice as long as width of head including eyes, with 3 apical segments and tips of 3rd to 7th segments dark to black.

Forewings hyaline, but somewhat flavescent, with veins yellowish brown, nearly 2.6 times as

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long as wide, broadly rounded at apex; cell cul very high, basal width versus height ratio less than 1.2.

Male proctiger relatively short, subtriangular, with posterior margin produced basally as a broad lateral lobes. Aedeagus with proximal segment roundly inflated near apex on dorsal margin in lateral aspect; distal segment rather straight with apex somewhat snake's head-like. Parameres a little longer than proctiger, broad basally, narrowed apically.

Female proctiger somewhat attenuate in apical portion, bearing with several long setae near middle.

**Length:** Body male 1.6-1.8mm, female 1.9-2.3mm; to tip of folded wings male 2.6-2.9mm, female 2.7-3.2mm.

**Locality:** CN : Mt. Deongsungsan, Mt. Gyeryongsan.

GB : Daegu, Dongwasa Temple (= Donghwasa Temple vic. Daegu)<sup>2</sup>, Gamcheon Myeon, Gyeongju, Hayang Eub, Mt. Hwanghagsan, Jungdae (=Jeongdae vic. Daegu)<sup>3</sup>, Pohang, Mt. Sansungsan (= Mt. Sanseongsan vic. Daegu)<sup>4</sup>, Songgrimsa Temple (= Songlimsa Temple vic. Daegu)<sup>5</sup>, Mt. Tohamsan, Mt. Unmoonsan (= Mt. Unmunsan)<sup>1</sup>, Urock (= Urog vic. Daegu)<sup>6</sup>, Yangnam Myeon, Yecheon Eub, Yeongcheon.

GG : Suweon.

GN : Busan, Mt. Gajisan, Is. Geoje-do, Mt. Geumsan, Masan, Samnam Myeon, Ulsan, Mt. Weonhyosan.

GW : Mugho, Nagsan Beach.

JB : Mt. Naejangsan.

JJ : Is. Chujado, Jeju, Jungmun, Seoguipo.

JN : Mt. Mudeungsan, Is. Wando.

**Distribution:** Korea, Japan (Honshu, Shikoku, Tsushima).

**Host-plant:** *Albizia julibrissin*.

18. *Acizzia jamatonica* (Kuwayama, 1908) (Jagui-namui)

*Psylla jamatonica* Kuwayama, 1908, Trans. Sapp. Nat. Hist. Soc. 2:167.

*Psylla jamatonica*: Oshanin, 1910, Ann. Mus. Zool. St. Pet. 15:191.

*Psylla jamatonica*: Aulmann, 1913, Psyll. Cat.: 19.

*Psylla jamatonica*: Shinji, 1944, Galls & Gall-Ins.: 444.

*Psylla jamatonica*: Kuwayama, 1950, Icon. Ins. Jap. ed. sec.: 325.

*Psylla jamatonica*: Sasaki, 1954, Sci. Rep. Mats. Agr. Coll. 14:34.

*Psylla jamatonica*: Miyatake, 1963, Journ. Fac. Agr. Kyushu Univ. 12(4):351-352.

*Psylla jamatonica*: Miyatake, 1964b, Bull. Osaka Mus. Nat. Hist. 17:26.

*Psylla jamatonica*: Miyatake, 1969c, Ibid. 22:69-70.

*Psylla jamatonica*: Baba et Miyatake, 1971, Ibid. 24:8.

*Psylla jamatonica*: Klimaszewski, 1973, Ann. Zool. 30(7):211.

*Psylla jamatonica*: Miyatake, 1976, Lif. Tsushima Is.: 490.

*Psylla jamatonica*: Okuno et al., 1977, Dis. & Pests Cult. Trees & Shrubs Col.:59.

*Psylla jamatonica*: Miyatake, 1977, Col. Ill. Ins. Jap. 2:162-163, pl. 38(611).

*Psylla jamatonica*: Loginova, 1977, Ent. Rev. 56(3):64.

*Psylla jamatonica*: Miyatake, 1979, Ins. Niigata Pref. 50:215.

*Psylla yamatonica* (sic): Park et al., 1979, Nat. & Life 9(2): 109<sup>1</sup>.

*Psylla yamatonica* (sic): Park et al., 1980b, Ibid. 10(1):11<sup>2-6</sup>.

*Psylla jamatonica*: Lee et kwon, 1981, Rep. Kor. Ass. Cons. Nat. 19:152<sup>7</sup>.

Type-locality: Japan.

**Description:** General coloration yellowish green in young specimens, yellowish brown to orange brown in older ones.

Vertex distinctly exceeding half as long as wide, with discal impressions shallow and located near middle. Genal cones very broad, about half as long as vertex, contiguous, slightly inclined downwards, blunt apically, with outer sides somewhat convex. Antennae about 1.3 to 1.4 times as long as width of head including eyes, with apical 2 segments and apices of 4th to 8th segments dark brown.

Forewings somewhat tinted with yellowish green in young specimens, reddish brown to dark brown in overwintering ones; surface spinules very minute and dense, completely covering membranes.

Male proctiger long, subtriangularly produced on basal half of ventral margin laterad. Parameres somewhat broad, with apices abruptly pointed. Aedeagus with apex recurved at dorsal tip.

Female proctiger with apex slightly dull; length of anus a little shorter than remainder of proctiger.

**Length:** Body male 1.5-1.7mm, female 2.0-2.3mm; to tip of folded wings male 2.3-2.5mm, female 2.4-2.7mm.

**Locality:** CN : Mt. Deongsungsan, Mt. Gyeryongsan.

GB : Daegu, Dasan Myeon, Donghwasan Temple<sup>②</sup>, Gamcheon Myeon, Mt. Geumosan, Gyeongju, Hayang Eub, Mt. Hwanghagsan, Mt. Juwangsan, Mt. Naeyeonsan, Mt. Palgongsan, Pohang, Mt. Sansungsan (= Mt. Sanseongsan vic. Daegu)<sup>③</sup>, Is. Ulreung (= Is. Ulleungdo; Dodong, Mt. Seonginbong)<sup>⑦</sup>, Mt. Unmoonsan (= Mt. Unmunsan)<sup>①</sup>, Unsu Myeon, Urock (= Urog vic. Daegu)<sup>④</sup>, Yangnam Myeon, Yongnam high school (= Daegu)<sup>⑤</sup>, Yongyeonsa Temple<sup>⑥</sup>.

GG : Suweon.

GN : Busan, Is. Geojedo, Mt. Geumsan, Mt. Jirisan, Msan, Samnam Myeon, Ulsan, Mt. Weonhyosan.

GW : Mugho.

JB : Mt. Deogyusan, Mt. Naejangsan.

JJ : Is. Chujado, Jeju, Jungmun, Seoguiipo, Seongsanpo.

JN : Is. Daeheugsando, Gwangju, Is. Hongdo, Mt. Mudeungsan.

**Distribution:** Korea, Japan (Hokkaido, Honshu, Kyushu, Shikoku, Tsushima).

**Host-plant:** *Albizia julibrissin*.

Genus 11. *Cyamophila* Loginova, 1976 (Dareub-namui-sog)

*Cyamophila* Loginova, 1976a, Ent. Rev. 55(3):65.

Type-species: *Psylla fabra* Loginova, 1964

Type-locality: U.S.S.R. (Kazakhstan).

Head as wide as or slightly wider than mesothorax. Vertex with anterior lobes triangularly rounded, weakly convex, like posterior angles of vertex; discal impressions prominent. Genal cones well developed, shorter or of same length as vertex. Antennal sockets with anterior margins projecting in front of median ocellus. Frons small, rhombic, almost entirely occupied by median ocellus.

Forewings with pterostigma and costal gap present; veins M and Cu1 with branches very long,

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nearly as long as or exceeding their stems;  $M_{1+2}$  subparalleled with  $M_{3+4}$ , Cula somewhat subparalleled with Culb of which apex strongly curved toward base of wing; radular spinules clearly apparent in cells m1, m2 and cul. Hindlegs with 5 saltatorial spines at apex; basal metatarsus with 2 saltatorial spines laterally.

Male proctiger without lobes posteriorly, tubular, only very slightly broadened in lower half of posterior margin. Parameres shorter than proctiger; apical margin usually extended and producing a short process anteriorly; Apical third often more or less angularly produced on anterior margin. Aedeagus with apex inflated on upper side, curved and narrowly terminated downward.

Formerly all of these groups were included in the genus *Psylla*. Hitherto comprising of 30 species endeavored by Loginova (1977, 1978a). In Korea, only 1 species occurs.

19. *Cyamophila hexastigma* (Hováth, 1899) (*Dareub-namui*)

*Psylla hexastigma* Hováth, 1899, Term. Fuez. 22:373.

*Psylla hexastigma*: Oshanin, 1907, Ann. Mus. Zool. St. Pet. 12:353.

*Psylla hexastigma*: Kuwayama, 1908, Trans. Sapp. Nat. Hist. Soc. 2:163-164.

*Psylla hexastigma*: Oshanin, 1910, Ann. Mus. Zool. St. Pet. 15:190.

*Psylla hexastigma*: Aulmann, 1913, Psyll. Cat.: 17.

*Psylla willieti* Wu, 1932, Peking Nat. Hist. Bull. 7(1):71-72.

*Psylla willieti*: Wu, 1935, Cat. Ins. Sin. 2:126.

*Psylla hexastigma*: Kuwayama, 1950, Icon. Ins. Jap. ed. sec.: 327.

*Psylla hexastigma*: Miyatake, 1963, Journ. Fac. Agr. Kyushu Univ. 12(4):339.

*Psylla hexastigma*: Miyatake, 1964b, Bull. Osaka Mus. Nat. Hist. 17:26.

*Psylla hexastigma*: Miyatake, 1969c, Ibid. 22:75.

*Psylla hexastigma*: Kuwayama et Miyatake, 1971, Mushi 45(2):53-54.

*Psylla hexastigma*: Klimaszewski, 1973, Ann. Zool. 30(7):209 (Korean Peninsula).

*Psylla hexastigma*: Miyatake, 1976, Lf. Tsushima Is.:493.

*Cyamophila hexastigma*: Loginova, 1977, Ent. Rev. 56(3): 68.

*Psylla hexastigma*: Miyatake, 1979, Ins. Niigata Pref. 50:217.

*Psylla hexastigma*: Park et al., 1979, Nat. & Life 9(2):108<sup>①</sup>.

*Psylla hexastigma*: Park et al., 1980b, Ibid. 10(1):12<sup>②</sup> - ③.

*Psylla hexastigma*: Park et Lee, 1980c, Ibid. 10(1):17<sup>④</sup> - ⑦.

Type-locality: U.S.S.R. (S.W. Siberia).

**Description:** General coloration yellowish green to green with olive markings on dorsum in young specimens, developing dark brown markings in older ones.

Vertex slightly shorter than half as long as wide. Genal cones shorter than vertex, well developed conically, somewhat stout, moderately divergent apically. Antennae very long and slender, distinctly exceeding twice as long as width of head including eyes.

Forewings hyaline, with 4 dark brown spots besides 1 at apex of clavus along posterior margins on each cell; vein Rs strongly bisinuate; cells m2 and cu1 somewhat subparallelogramy. Hindtibia with 5 saltatorial spines arranged 1+3+1 at apex.

Male proctiger longer than parameres, simple tubular. Parameres somewhat angularly bent near middle; apical margins armed with a spine-like process directed anterad, and produced caudad. Apex of aedeagus broadly inflated, with tip greatly produced.

Female genitalia very long. Proctiger longer than subgenital plate; length of anus less than half as long as remainder of proctiger.

**Length:** Body male 2.6-2.8mm, female 2.6-2.9mm; to tip of folded wings male 3.8-3.9mm, female 3.8-4.0mm.

**Locality:** CB : Danyang.

CN : Mt. Deogsungsan, Mt. Gyeryongsan.

GB : Daegu, Hayang Eub, Kachang (= Gachang vic. Daegu)<sup>②</sup>, Mt. Naeyeonsan, Mt. Palgongsan<sup>④</sup>, Mt. Sansungsan (= Mt. Sanseongsan vic. Daegu)<sup>②</sup>, Mt. Sobaegsan, Mt. Unmoonsan (= Mt. Unmunsan)<sup>①</sup>, Yeongpung Gun<sup>⑥</sup>, Yongyeonsa Temple<sup>③</sup>.

GG : Seoul, Is. Ganghwado, Suweon.

GN : Mt. Gayasan, Mt. Geumsan, Pyochungsa Temple<sup>⑦</sup>, Weonhyosan, Mt. Yeongchuisan.

GW : Mt. Chiagsan, Mt. Obongsan, Mt. Odaesan, Mt. Seolagsan.

JJ : Mt. Hanlasan.

JN : Is. Hongdo, Mt. Mudeungsan.

**Distribution:** Korea, Japan (Hokkaido, Honshu, Kyushu, Shikoku, Tsushima), China (Shansi, Peiping), U.S.S.R. (S.W. Siberia).

**Host-plant:** *Hydrangea* sp., *Maackia amurensis*, *Styphnolobium japonicum*.

#### Sufamily PSYLLINAE Burmeister, 1835 (Namui-agwa)

Body generally medium to large size, or rarely small. Head usually wider than prothorax, nearly as wide as mesothorax. Vertex distinctly broader than long, more or less flat, with discal impressions prominent. Genal cones well developed, contacting basally, more often concave along outer sides. Clypeus very short and small. Antennal sockets located high in front of eyes, with anterior walls formed by well developed intercalary plates producing facial surface of head. Eyes strongly convex, somewhat spherical, extending well beyond lateral extremities of post-orbital ridges. Frons invisible, enveloped between bases of genal cones, with median ocellus prominent. Antennae slender, filiform, varied in length.

Thorax convexly arched. Forewings membraneous, elongate or oval; pterostigma usually present; costal gap prominent. Hindtibia usually with a genual spine at base or absent, armed with 4 to 7 saltatorial spines at apex; basal metatarsus with 2 saltatorial spines.

Male proctiger with or without posterior lobes. Parameres usually narrow or often more or less broad, with or without processes.

Female genitalia wedge shaped and varied in length.

Generally a worldwidely represented group in urgent need of more extensive revision. In Palaearctic Region exceeding 173 species belonging to 3 genera have been known to occur.

#### Genus 12. *Psylla* Geoffroy, 1762 (Namui-sog)

*Psylla* Geoffroy, 1762, Hist. abr. Ins. trouv. env. Par. 1:482-489.

Type-species: *Chermes alni* Linnaeus, 1758

Type-locality: Sweden.

Head usually strikingly inclined forward and downward. Genal cones prominent and well developed, contacting basally, more often concave along outer sides, divergent or contiguous, more or less obliquely blunt or truncate apically. Antennal sockets scarcely encroaching on genae and genal cones, located high in front of eyes. Clypeus very short and small. Frons invisible, enveloped between bases of genae, bearing prominent median ocellus.

Thorax convexly arched, most steeply distended on anteromedian part of prescutum and on sides of mesoscutum.

Pronotum yoke shaped, narrow, inclined downward, giving way more or less as a narrow rib to propleurites, which separated by a diagonally extending slightly sigmoidal pleural suture turning toward posterior margin of pronotum.

Forewings elongate or oval, rounded or rarely more or less obliquely rounded apically. Hindtibia with 4 to 7 saltatorial spines at apex; basal metatarsus with 2 thick saltatorial spines.

Male proctiger simple tubular, slightly dilated in basal half of posterior margin, or rarely produce. Parameres varied, usually pointed apically.

Female genitalia varying in shape and length, most often wedge shaped.

Larger genus being nearly cosmopolitan, occurring on a various host plants. About 350 species in the world, some 170 species belonging to 7 subgenera in Palaearctica.

The present genus was recently revised mainly by Ossiannilsson (1970), Kłmaszewski (1975), Loginova (1978c), and Burckhardt (1979). But the subgeneric status are still insufficiently investigated, and need further examination, the following subgenera are slightly modified after Loginova (1978c) in the definition of adult and nymphal structure.

#### Key to subgenera of *Psylla*

1. Hindtibia with 6 to 7 saltatorial spines. Female genitalia far longer than other abdominal segments . . . . . *Psylla* s. str.  
— Hindtibia with 5 saltatorial spines. Female genitalia usually shorter than the other abdominal segments . . . . . 2.
2. Mesothorax with scutum obviously longer than praescutum mesally, about twice as long as pronotum . . . . . *Thamnopsylla*  
— Mesothorax with scutum same length as or slightly longer than praescutum each of them exceeding twice as long as pronotum mesally . . . . . 3.
3. Male parameres narrowly lamellar, their narrowed apices terminating in a forward-directed tooth. Female genitalia short, wedge-like. Nymph-V with antennae 8 segmented . . . . . *Cacopsylla*  
— Male parameres with various structural types, sometimes intricately shaped. Female genitalia varied. Nymph-V with antennae 7 segmented . . . . . *Hepatopsylla*

Subgenus *Psylla* Geoffroy, 1762 (Namui-asog)

*Psylla* Geoffroy, 1762, Hist. abr. Ins. trouv. env. Par. 1:482-489.

Type-species: *Chermes alni* Linnaeus, 1758

Type-locality: Sweden.

Genal cones distinctly shorter than vertex, broad at base, strongly divergent apically.

Forewings uniformly rounded along apical margin; membrane colorless, at least in cells c and culb; veins most often dark. Hindtibia with 6 to 7 saltatorial spines.

Nymph-V: Antennae 8 segmented, rhinaria on 3rd, 5th, 7th and 8th segments; there is a tendency for supplementary division of the 3rd and last segments, with the result antennae may appear 9 to 10 segmented. Anus terminal, surrounded by a multiserial ring of rounded, irregularly shaped pores carrying over onto the dorsal and ventral sides of abdomen; few setae on body, no sect-achaetae.

In Palaearctica hitherto 14 species have been known to occur, associated with plants of *Alnus*, *Betula*, and *Carpinus*.



20. *Psylla* (s. str.) *alni* (Linnaeus, 1758) (Ori-namui)

- Chermes alni* Linnaeus, 1758, Syst. Nat. 10ed. 1:454.  
*Psylla alni*: Geoffroy, 1762, Hist. abr. Ins. trouv. env. Par. 1:482-489.  
*Chermes alni*: Linnaeus, 1767, Faun. Suec.: 1008.  
*Psylla alni*: Degeer, 1773, Mem. 1, 3:148, p1. 10(8-18).  
*Psylla alni*: Zetterstedt, 1828, Faun. Ins. Lapp.: 556.  
*Psylla alni* + *P. fuscinervis* + *P. heydeni*: Foerster, 1848, Verh. nat. Ver. preuss. Rheinl. 3:70, 81.  
*Psylla alni*: Flor, 1861a, Rhynch. Livl. 2:460.  
*Psylla alni*: Flor, 1861b, Bull. Soc. Nat. Mosc. 34:342, 350, 353.  
*Psylla fuscinervis* (nec Foerster) + *P. heydeni* (nec Foerster): Meyer-Duer, 1871, Mitth. Schweiz. ent. Ges. 3:395.  
*Psylla alni*: Lethierry, 1874, Cat. Nord.: 90.  
*Psylla alni*: Scott, 1876, Trans. Ent. Soc. Lond.: 532.  
*Psylla alni*: Loew, 1876, Verh. zool-bot. Ges. Wien. 26: p1.2 (26, 32-35).  
*Psylla alni*: Reuter, 1876, Medd. F. Fenn. 1:70.  
*Chermes alni*: Thomson, 1877, Op. ent. 8:831.  
*Psylla alni*: Reuter, 1881, Ent. Tidskr. 2:161.  
*Psylla alni*: Witlaczil, 1885, Zeitschr. Wiss. Zool. 42:569, p1.21 (18, 20-21).  
*Psylla alni*: Horváth, 1885, Math. term. Koezl. 21:311.  
*Psylla alni*: Edward, 1896, Hem. Hom. Brit. Isl.: 248, p1.27(4).  
*Psylla alni*: Bluemml, 1899, 111. Zeitschr. Ent. 4:305-308.  
*Psylla alni*: Strand, 1902, Ent. Tidskr. 23:270.  
*Psylla alni*: Sulc, 1905, Cas. Cesk. Spol. Ent. 2:3.  
*Psylla alni*: Oshanin, 1907, Ann. Mus. Zool. St. Pet. 12:356.  
*Psylla alni*: Kuwayama, 1908, Trans. Sapp. Nat. Hist. Soc. 2:169.  
*Psylla alni*: Sulc, 1909, Sitz.-Ber. Boehm. Ges. Wiss. 22:26.  
*Psylla alni*: Sulc, 1910, Rozpr. C. Akad. Cis. Frant. 19:6-10.  
*Psylla alni*: Oshanin, 1910, Ann. Mus. Zool. St. Pet. 15:192.  
*Psylla alni*: Aulmann, 1913, Psyll. Cat.: 9-10.  
*Psylla alni*: Matsumura, 1916, Appl. Ent. 1:373.  
*Psylla alni*: Horváth, 1918, Faun. Reg. Hung. 8:58.  
*Psylla alni*: Haupt, 1935, Tierw. Mitt. 4:232.  
*Psylla alni americanella* Strickland, 1939, Can. Ent. 71:214.  
*Psylla alni*: Schaefer, 1949, Mitt. Schweiz. Ent. Ges. 22(1):46-47.  
*Psylla alni*: Kuwayama, 1950, Icon. Ins. Jap. ed. sec.:325.  
*Psylla alni*: Ossiannilsson, 1952, Opusc. Ent. 17:196.  
*Psylla alni*: Sasaki, 1954, Sci. Rep. Mats. Agr. Coll. 14:33.  
*Psylla alni*: Vondracek, 1957, Faun. CSR. 9:247-249.  
*Psylla alni*: Lindberg et Ossiannilsson, 1960, Faun. Fenn. 8:11.  
*Psylla alni*: Loginova, 1962b, Trudy zool. Inst. Akad. Nauk. 31:38-39.  
*Psylla alni*: Dobreanu et Manolache, 1962, Faun. Rep. pop. Rom. Ins. 8(3):173-176.  
*Psylla alni*: Miyatake, 1963, Journ. Fac. Agr. Kyushu Univ. 12(4):334-335.  
*Psylla alni*: Loginova, 1964a, Keys Ins. Eur. U.S.S.R. 1:465.  
*Psylla alni*: Miyatake, 1964b, Bull. Osaka Mus. Nat. Hist. 17:25.  
*Psylla alni*: Miyatake, 1965a, Icon. Ins. Jap. Col. nat. ed. 3:148, p1.74(14).  
*Psylla alni*: Loginova, 1966b, Trudy Mold. nauchn.-issl. Inst. 13:144.  
*Psylla alni*: Loginova, 1968, Trudy Vses. Ent. Obshch. 52:297.  
*Psylla alni*: Miyatake, 1969c, Bull. Osaka Mus. Nat. Hist. 22:73.

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- Psylla alni*: Klimaszewski, 1970a, Ann. Univ. Mar. Cur.-Sklod. 24:231.  
*Psylla alni*: Ossiannilsson, 1970, Ent. Scand. 1:142.  
*Psylla alni*: Klimaszewski, 1971, Fragm. Faun. 17(7): 166.  
*Psylla alni*: Klimaszewski, 1972, Ann. Univ. Mar. Cur.-Sklod. 27:13.  
*Psylla alni*: Miyatake, 1972a, Mem. Nat. Sci. Mus. Tokyo 5:101.  
*Psylla alni*: Klimaszewski, 1973, Ann. Zool. 30(7):200.  
*Psylla alni*: Klimaszewski, 1975, Faun. Polsk. 3:137-139.  
*Psylla alni*: Hodkinson, 1976, Ent. Gaz. 27:124.  
*Psylla alni*: Miyatake, 1977, Col. Ill. Ins. Jap. 2:162, pl. 38(609).  
*Psylla alni*: Okuno et al., 1977, Dis. & Pests Cult. Trees & Shrubs Col.: 59.  
*Psylla* (s. str.) *alni*: Loginova, 1978, Ent. Rev. 57 (4): 563.  
*Psylla alni*: Miyatake, 1979, Ins. Niigata Pref. 50:216.  
*Psylla alni*: Hodkinson et White, 1979, Handb. Ident. Brit. Ins. 2(5a):48, 55.  
*Psylla alni*: Park et al., 1979, Nat. & Life 9(2):108<sup>④</sup>.  
*Psylla alni*: Park et al., 1980b, Ibid. 10(1): 13<sup>②</sup> - ⑤.  
*Psylla alni*: Hodkinson, 1980, Arct. & Alp. Res. 12(3):375.  
*Psylla* (s. str.) *alni*: White et Hodkinson, 1982, Handb. Ident. Brit. Ins. 2(5b):28.

Type-locality: Sweden.

Description: General coloration yellowish green to bright green in young specimens, developing brown or red markings in older ones.

Generally larger species. Vertex a little shorter than half as long as wide, with posterior margin roundly emarginated. Genal cones short, strongly divergent, slightly exceeding half as long as vertex. Antennae strikingly long and slender, nearly 3 times as long as width of head including eyes or more.

Forewings clear, 2.3 times as long as wide, pterostigma relatively short, with veins dark.

Male proctiger very long, simple tubular, strikingly exceeding length of paramere. Parameres long, club shaped, slightly broad basally, with apices dilated bearing 2 small inwardly directed dendicles. Aedeagus with distal segment distinctly shorter than parameres, somewhat narrowed apically; apex oval, roundly inflated on dorsal side.

Female genitalia very long and slender, apparently longer than rest of abdomen. Proctiger longer than subgenital plate; length of anus less than one-fourth as long as remainder of proctiger.

Length: Body male 3.4-3.6mm, female 3.7-4.2mm; to tip of folded wings male 4.8-5.2mm, female 5.2-5.6mm.

Locality: CN : Mt. Gyeryongsan.

GB : Daegu, Dansan Myeon, Mt. Hwanghagsan, Jungdae (= Jeongdae vic, Daegu)<sup>②</sup>, Mt. Juwangsan, Mt. Naeyeonsan, Pagaesa Temple (= Pagyesa Temple)<sup>③</sup>, Mt. Palgongsan, Mt. Sansungsan (= Mt. Sanseongsan vic. Daegu)<sup>④</sup>, Mt. Sobaegsan, Mt. Tohamsan, Mt. Unmoonsan (= Mt. Unmunsan)<sup>①</sup>, Unsu Myeon, Yongyeonsa Temple<sup>⑤</sup>.

GG : Mt. Bughansan, Gwangleung, Mt. Myeongseongsan, Seoul, Suweon.

GN : Busan, Mt. Gajisan, Mt. Gayasan, Mt. Jirisan, Masan, Samnam Myeon, Mt. Weonhyosan, Mt. Yeongchuisan.

GW : Mt. Chiagsan, Mt. Obongsan, Mt. Odaesan, Mt. Seolagsan.

JB : Mt. Deogyusan, Mt. Mayisan, Mt. Naejangsan, Mt. Unjangsan.

Distribution: Korea, Japan (Hokkaido, Honshu), China, whole U.S.S.R. including Sakhalin, Europe, N. America.

Host-plant: *Alnus* spp.

Subgenus *Thamnopsylla* Loginova, 1978 (Bae-namui-asog)

*Thamnopsylla* Loginova, 1978c, Ent. Rev. 57(4):563.

Type-species: *Psylla pyrisuga* Foerster, 1848

Type-locality: Germany.

Genal cones stout, broad at base, bluntly pointed apically, divergent, usually shorter than vertex.

Mesothorax with scutum obviously longer than praescutum mesally, about twice as long as pronotum.

**Nymph-V:** Antennae 7 segmented; rhinaria on 3rd, 5th, and 7th segments, 2 on last segments. Preanal sclerites not fused with sclerite of anal area or last pair of lateral sclerites may be welded to it only along the very edge of abdomen, remaining clearly segregated and each bearing single spiracle; last 3 pairs of lateral sclerites and 2 pairs of median sclerites large, approximated to each other and to anal area. Circumanal ring consisting of a row of slit-like pores, irregularly oval in shape, with sharply impressed anterior margin and weakly impressed posterior margin, occupying one-third to a half width of sclerite of anal area; along the edge of abdomen there are 2 or 3 pairs of sectachaetae with 5 to 7 pairs of long cerachaetae.

In the Palaearctica about 26 species are included, generally associated with plants of Rosales of the genera *Malus*, *Pyrus*, *Prunus*, *Crataegus*, *Sorbus*, and on *Rhamnus*.

## 21. *Psylla* (*T.*) *pyrisuga* Foerster, 1848 (Bae-namui)

*Psylla pyrisuga* Foerster, 1848, Verh. Nat. Ver. Preuss. Rheinl. 3:78.

*Psylla austriaca* Flor, 1861, Kat. Rhynch.: 372.

*Psylla rutila* + *P. rufitarsis* + *P. pyrisuga*: Meyer-Duer, 1871, Mitth. Schweiz. Ent. Ges. 3:394, 397-398.

*Psylla pyrisuga*: Reuter, 1876, Medd. F. Fenn. 1:63.

*Psylla pyrisuga*: Loew, 1879, Verh. zool.-bot. Ges. Wien 29:568, pl.15(16).

*Psylla pyrisuga*: Schwarz in Uhler, 1896, Proc. U.S. Nat. Mus. 19:297.

*Psylla pyrisuga*: Oshanin, 1907, Ann. Mus. Zool. St. Pet. 12:354.

*Psylla pyrisuga*: Kuwayama, 1908, Trans. Sapp. Nat. Hist. Soc. 2:165-166.

*Psylla pyrisuga*: Sulc, 1909, Sitz.-Ber. Boehm. Ges. Wiss. 22:28.

*Psylla pyrisuga*: Oshanin, 1910, Ann. Mus. Zool. St. Pet. 15:190.

*Psylla pyrisuga*: Aulmann, 1913, Psyll. Cat.: 24-25.

*Psylla pyrisuga*: Sulc, 1915, Rozpr. C. Akad. Cis. Frant. Jos. 24:14-18.

*Psylla pyrisuga*: Matsumura, 1916, Appl. Ent. 1:371-372, pl.14(10).

*Psylla pyrisuga*: Horváth, 1918, Faun. Reg. Hung. 8:58.

*Psylla pyrisuga*: Matsumura, 1931, 6000 Ill. Ins. Jap. Emp.: 1275-1276.

*Psylla pyrisuga*: Haupt, 1935, Tierw. Mitt. 4:x, 237.

*Psylla pyrisuga*: Fintescu, 1938, Acad. Rom. Mem. Sect. St. ser. 3, 14(6): 3-5.

*Psylla pyrisuga*: Shinji, 1944, Galls & Gall.-Ins.: 448 (Korea).

*Psylla pyrisuga*: Schaefer, 1949, Mitt. Schweiz. Ent. Ges. 22(1): 30.

*Psylla pyrisuga*: Kuwayama, 1950, Icon. Ins. Jap. ed. sec.: 326.

*Psylla pyrisuga*: Ossiannilsson, 1952, Opusc. Ent. 17:196.

*Psylla pyrisuga*: Smreczynski, 1954, Fragm. Faun. 7:140.

*Psylla pyrisuga*: Sasaki, 1954, Sci. Rep. Mats. Agr. Coll. 14:35-36 (Korea).

*Psylla pyrisuga*: Vondracek, 1957, Faun. SCR 9:264-267.

*Psylla pyrisuga*: Lindberg et Ossiannilsson, 1960, Faun. Fenn. 8:15.

*Psylla pyrisuga*: Dobreanu et Manolache, 1962, Faun. Rep. pop. Rom. Ins. 8(3):195-198.

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- Psylla prysisuga*: Paik et al., 1963, Agr. For. Ent.: 255-256 (Korea).  
*Psylla prysisuga*: Loginova, 1964a, Keys Ins. Eur. U.S.S.R. 1:472.  
*Psylla prysisuga*: Miyatake, 1964a, Journ. Fac. Agr. Kyushu Univ. 13(1):27 (Korea).  
*Psylla prysisuga*: Loginova, 1966b, Trudy Mold. nauch.-issl. Inst. 13:146-141.  
*Psylla prysisuga*: Loginova, 1968, Trudy Vses. Ent. Obshch. 52:304.  
*Psylla prysisuga*: Miyatake, 1969c, Bull Osaka Mus. Nat. Hist. 22:75 (Korea).  
*Psylla prysisuga*: Ko, 1969, List For. Ins. Pests Kor.: 24(Korea).  
*Psylla prysisuga*: Klimaszewski, 1970a, Ann. Mar. Cur.-Skod. 24:234.  
*Psylla (Hepatopsylla) pyrisuga*: Ossiannilsson, 1970, Ent. Scand. 1:142.  
*Psylla prysisuga*: Klimaszewski, 1971, Fragm. Faun. 17(7):171.  
*Psylla prysisuga*: Miyatake, 1971a, Bull. Osaka Mus. Nat. Hist. 24:1 (Korea).  
*Psylla prysisuga*: Kor. Soc. Pl. Prot., 1972, List Pl. Dis., Ins. Pests, & Weeds Kor.: 122 (Korea).  
*Psylla prysisuga*: Klimaszewski, 1973, Ann. Zool. 30(7):222.  
*Cacopsylla pyrisuga*: Klimaszewski, 1975, Faun. Polsk. 3:161-163.  
*Psylla pyrisuga*: Miyatake, 1977, Col. Ill. Ins. Jap. 2:163, p1.38 (612) (Korea).  
*Psylla (Thamnopsylla) pyrisuga*: Loginova, 1978c, Ent. Rev. 57(4):565.  
*Psylla pyrisuga*: Miyatake, 1979, Ins. Niigata Pref. 50:217.  
*Psylla pyrisuga*: Hodkinson et White, 1979, Hanb. Ident. Brit. Ins. 2(5a): 53,58.  
*Psylla (Thamnopsylla) pyrisuga*: White et Hodkinson, 1982, Ibid. 2(5b):35.

Type-locality: Germany.

**Description:** General coloration yellowish green to yellowish brown in young specimens, rust red to dark brown in older ones, with yellowish brown longitudinal stripes on dorsum.

Generally a larger species. Vertex slightly shorter than half as long as wide. Genal cones light in tint, somewhat broad conical, rounded and well divergent apically, slightly shorter than vertex. Antennae a little longer than width of head including eyes; apical portions of 4th to 8th and last 2 segments dark to black.

Forewings clear, somewhat broadly ovate, about 2.5 times as long as broad; spinules dark and prominent, completely covering cell c+sc; veins yellowish brown to dark.

Male proctiger long cylindrical, distinctly higher than subgenital plate. Aedeagus somewhat slender, with apex elongately inflated. Parameres somewhat broad and stout, nearly subparallel-sided in lateral view, bearing apically a blunt inwardly directed tooth.

Female proctiger distinctly longer than subgenital plate; dorsal margin slightly wavy, with apex roundly terminated; length of anus almost half as long as remainder of proctiger.

They are famous pests in pear orchards throughout Eurasia.

**Length:** Body male 2.1-2.4mm, female 2.6-2.9mm; to tip of folded wings male 3.5-3.8mm, female 4.0-4.3mm.

**Locality:** GG : Anseong.

GN : Mt, Jirisan, Samnam Myeon.

JN : Gwangju.

**Distribution:** Korea, Japan (Hokkaido, Honshu, Kyushu, Shikoku), China, whole U.S.S.R., Europe, etc., whole Palaearctica.

**Host-plant:** *Pyrus communis*, *P. ussuriensis*.

Subgenus *Cacopsylla* Ossiannilsson, 1970 (Sagwa-namui-asog)

*Cacopsylla* Ossiannilsson, 1970, Ent. Scand. 1:140.

Type-species: *Chermes mali* Schmidberger, 1836

Type-locality: Austria.

Genal cones well developed, rather slender, bluntly pointed apically, usually divergent, about as long as or slightly shorter than vertex.

Male parameres narrow, more or less slender, with apex terminating in a forward-directed tooth. Female genitalia short, wedge shaped.

**Nymph-V:** Antennae 8 segmented; rhinaria on 4th, 6th, and 8th segments, 2 on 8th segments. Circumanal ring oval, consisting of 3 to 5 rows of rounded pores, occupying about one-third width of sclerite of anal area; 8 to 12 pairs of long hair-like cerachaetae along edge of abdomen, and also on occasion 2 pairs on sectachaetae; row of long cerachaetae along outer margin of anterior pair of wingpads, 2 such cerachaetae at apex of posterior pair.

In Palaearctica 6 species are included, associated with plants of Rosales of the genera *Malus*, *Sorbus*, *Crataegus*, and on *Ulmus*.

#### Key to species of *Cacopsylla*

1. Antennae longer than 1.7 times as long as width of head including eyes. Apex of aedeagus in male small, moderately inflated . . . . . *P. (C.) mali*  
 —. Antennae shorter than 1.5 times as long as width of head including eyes. Apex of aedeagus in male somewhat quadrate, greatly inflated . . . . . 2.
2. Male aedeagus with dorsal tip roundly produced. Apex of paramere more sharp. Dorsum coloring yellowish orange . . . . . *P. (C.) peninsularis* sp. nov.  
 —. Male aedeagus with dorsal tip somewhat angularly produced. Apex of paramere less sharp. Dorsum coloring reddish orange . . . . . *P. (C.) peninsularis hanlasanensis* sp. et ssp. nov.

#### 22. *Psylla (C.) mali* (Schmidberger, 1836) (Sagwa-namui)

*Chermes mali* Schmidberger, 1836, Beitr. Nat. Schaedl. Ins. 4:186-199.

*Psylla mali* + *P. dubia* + *P. aeruginosa* + *P. crataegicola* + *P. occulata*: Foerster, 1848, Verh. Nat. Ver. preuss. Rheinl. 3:72, 73, 97, 98.

*Psylla mali*: Flor, 1861, Rhynch. Livl. 2:476.

*Psylla mali* + *P. dubia* + *P. aeruginosa* + *P. crataegicola* + *P. occulata*: Meyer-Duer, 1871, Mitth. Schweiz. Ent. Ges. 3:398-400.

*Psylla mali*: Lethierry, 1874, Cat. Nord.: 91.

*Chermes mali*: Thomson, 1876, Opusc. Ent. 8:835.

*Psylla mali* + *P. viridissima* Scott, 1876, Trans. Ent. Soc. Lond.: 542-543.

*Psylla mali*: Loew, 1877, Verh. Zool.-bot. Ges. Wien. 27:135.

*Psylla mali*: Rueter, 1881, Ent. Tidskr. 2:155.

*Psylla mali*: Loew, 1882, Verh. zool.-bot. Ges. Wien. 32:242.

*Psylla mali*: Horvath, 1885, Math. term. Kozl. 21:311.

*Psylla mali*: Edwards, 1896, Hem. Hom. Brit. Isl.: 247.

*Psylla mali*: Oshanin, 1907, Ann. Mus. Zool. St. Pet. 12:355.

*Psylla mali*: Kuwayama, 1908, Trans. Sapp. Nat. Hist. Soc. 2:167-168.

*Psylla mali*: Sulc, 1909, Sitz. Ber. Boehm. Ges. Wiss. 22:27.

*Psylla mali*: Oshanin, 1910, Ann. Mus. Zool. St. Pet. 15:191.

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- Psylla mali*: Aulmann, 1913, Psyll. Cat.: 19-20.  
*Psylla mali*: Matsumura, 1916, Appl. Ent. 1:373.  
*Psylla mali*: Horváth, 1918, Faun. Reg. Hung. 8:58.  
*Psylla mali*: Haupt, 1935, Tierw. Mitt. 4:x, 236.  
*Psylla mali*: Schaefer, 1949, Mitt. Schweiz. Ent. Ges. 22(1):25-26.  
*Psylla mali*: Ossiannilsson, 1952, Opusc. Ent. 17:196.  
*Psylla mali*: Smreczynski, 1954, Fragm. Faun. 7:139.  
*Psylla mali*: Sasaki, 1954, Sci. Rep. Mats. Agr. Coll. 14:34-35.  
*Psylla mali*: Vondracek, 1957, Faun. CSR. 9:255-259.  
*Psylla mali*: Lindberg et Ossiannilsson, 1960, Faun. Fenn. 8:14.  
*Psylla mali*: Dobreanu et Manolache, 1962, Faun. Rep. pop. Rom. Ins. 8(3):199-203.  
*Psylla mali*: Miyatake, 1964a, Journ. Fac. Agr. Kyushu Univ. 13(1):20.  
*Psylla mali*: Loginova, 1964a, Keys Ins. Eur. U.S.S.R. 1:469.  
*Psylla mali*: Loginova, 1966b, Trudy Mold. nauchn.-issl. Inst. 13:135-136.  
*Psylla mali*: Loginova, 1968, Trudy Vses. Ent. Obshch. 52:298.  
*Psylla mali*: Klimaszewski, 1970a, Ann. Mar. Cur.-Sklod. 24:233.  
*Psylla (Cacopsylla) mali*: Ossiannilsson, 1970, Ent. Scand. 1:140, 142.  
*Psylla mali*: Klimaszewski, 1971, Fragm. Faun. 17(7):168.  
*Cacopsylla mali*: Klimaszewski, 1972, Ann. Mar. Cur.-Sklod. 27:12.  
*Psylla* sp.: Miyatake, 1972a, Mem. Nat. Sci. Mus. Tokyo. 5:101.  
*Psylla mali*: Klimaszewski, 1973, Ann. Zool. 30(7):214.  
*Psylla mali*: Loginova, 1974b, Ins. Mong. 2:56-57.  
*Psylla mali*: Hodkinson, 1974, Bull. Ent. Res. 64:327, 329.  
*Cacopsylla mali*: Klimaszewski, 1975, Faun. Polsk. 3:152-154.  
*Psylla mali*: Hodkinson, 1976a, Ent. Gaz. 27:125.  
*Psylla (Cacopsylla) mali*: Loginova, 1978c, Ent. Rev. 57(4):564.  
*Psylla mali*: Hodkinson et Whate, 1979, Handb. Ident. Brit. Ins. 2(5a): 54, 56-57.  
*Cacopsylla mali*: Hodkinson, 1980, Journ. Biog. 7:133.  
*Psylla (Cacopsylla) mali*: White et Hodkinson, 1982, Handb. Ident. Brit. Ins. 2(5b):30.

Type-locality: Austria.

Description: General coloration yellowish green to bright green in young specimens, reddish ochre to chestnut brown in older ones.

Vertex slightly exceeding half as long as wide, with discal impressions deep and located next to middle near posterior margin. Genal cones about as long as vertex mesally, long and slender, well divergent distally. Antennae long, distinctly exceeding 1.7 times as long as width of head including eyes.

Forewings clear, elongate, with veins concolorous in young specimens, dark brown in older ones; surface spinules relatively dense and compact, distributing in all cells, leaving very narrow spinule-free stripes along margins of veins.

Male proctiger longer than parameres. Parameres narrowed distally, with apices sharply hooked. Aedeagus somewhat straight; apex small, less inflated.

Female genitalia relatively shorter, as long as wide. Proctiger with apex somewhat dull, gently narrowed: length of anus nearly half as long as remainder of proctiger.

Length: Body male 1.9-2.2mm, female 2.2-2.5mm; to tip of folded wings male 3.3-3.6mm, female 3.7-4.1mm.

Locality: GB : Daegu, Mt. Palgongsan.

GG : Suweon.

GN : Mt. Jirisan, Samnam Myeon.

GW : Mt. Odaesan, Mt. Seolagsan.

**Distribution:** Korea (new record), Japan (Hokkaido, Honshu), whole U.S.S.R., Europe, etc. whole Palaearctica, N. America.

**Host-plant:** *Malus pumila* var. *dulcissima*, *M. asiatica*.

This species has been known as "apple sucker", an important pest at apple orchard in Europe, but in Korea it seems little injurious to pomoculture because of heavy chemical control.

**23-a. *Psylla (C.) peninsularis* Kwon, sp. nov. (Dalmeunsagwa-namui)**

**Description:** General coloration pale yellowish orange to yellowish orange, with dorsum deeper in tint and with venter lighter.

Vertex nearly half as long as wide; discal impressions prominent. Genal cones a little shorter than vertex, well divergent apically. Antennae about 1.4 times as long as width of head including eyes, with apical 2 segments dark brown to black and tips of 4th to 8th segments brown.

Forewings clear; veins furnished with short hairs; surface spinules prominent, distributed in all cells, leaving narrow spinule-free stripes along margins of veins.

Male proctiger longer than parameres, slightly sigmoid shape in lateral view. Parameres tapered apically, with apices sharply pointed and curved inner-cephalad. Aedeagus with apex of distal segment greatly extended, for more exceeding twice as wide as shaft; dorsal tip roundly produced.

Female genitalia a little longer than wide. Proctiger with apex roundly pointed; length of anus slightly exceeding half as long as remainder of proctiger.

**Length:** Body male 1.6mm, female 2.1mm; to tip of folded wings male 3.1mm, female 3.3mm.

**Types-examined:** Holotype male, Mt. Palgongsan, GB, S. Korea, 23, V, 1981, coll. Y.J. Kwon; paratypes: 1 male, 3 females, same data as holotype; 3 females, 25, V, 1981, same locality; 5 males, 8 females, 27, V, 1981, same locality; Mt. Gajisan, GN, S. Korea, 2 females, 7, VI, 1981, coll. Y.J. Kwon.

**Remark:** This new species resembles *Psylla peregrina* Foerster, 1848, and *P. sorbi* (Linnaeus, 1758) in general appearance, but is separated from the latter by the presence of surface spinules completely distributed on the cell c+sc of forewing.

**Host-plant:** Unknown.

**23-b. *Psylla (C.) peninsularis hanlasanensis* Kwon, sp. et ssp. nov. (Hanladalmeunsagwa-namui)**

**Description:** General coloration much deeper than the nominate subspecies. Aedeagus with apex of distal segment somewhat subrectangular; dorsal tip angularly produced.

Other characters resembling the nominate one.

**Type-examined:** Holotype male, Mt. Hanlasan, JJ, S. Korea, 23, VII, 1981, coll. Y.J. Kwon; paratypes: 5 males, 7 females, 22-23, VII, 1981, same locality Jungmun, JJ, S. Korea, 1 female, 23, VII, 1981, coll. Y.J. Kwon.

**Host-plant:** Unknown.

Subgenus *Hepatopsylla* Ossiannilsson, 1970 (Daeryug-namui-asog)

*Hepatopsylla* Ossiannilsson, 1970, Scand. Ent. 1:142.

Type-species: *Cermes nigrita* Zetterstedt, 1828

Type-locality: Sweden.

Genal cones well developed, varied in shape, divergent or contiguous, shorter or slightly longer than vertex.

Male parameres with various structural types, sometimes intricately shaped. Female genitalia varied, long or short.

Nymph-V: Antennae 7 segmented; rhinaria on 3rd, 5th and 7th segments, 2 on 7th segment. Circumanal ring consisting of a row of slit-like pores occupying one-fifth or even less of width of sclerite of anal area, sometimes depressed in front; 7 to 12 pairs of pointed cerachaetae, often differing in length, along edge of abdomen, sectachaetae wanting.

Still insufficiently investigated groups are provisionally included to this subgenus, and further survey on nymphal structure may be resulted to split out several additional subgenera inevitably. Currently largest subgenus, comprising of apparently exceeding 117 species in Palaearctic and Nearctic Regions, generally feeding on *Salix*, *Acer*, *Hippophae*, *Ledum*, *Vaccinium*, *Viscum*, *Viburnum*, and on Rosales (*Pyrus*, *Elaeagnus*).

#### Key to species of *Hepatopsylla*

1. Female proctiger in lateral aspect very sharply acute and strongly upturned apically . . . . . 2  
— Female proctiger in lateral aspect not sharply acute nor strongly upturned apically . . . . . 5
2. Antennae about twice as long as width of head including eyes. Forewings dark brown with a transparent area near Culb . . . . . *P. (H.) fulguralis*  
— Antennae distinctly less than twice as long as width of head including eyes. Forewings not dark brown . . . . . 3.
3. Forewings with 4 dark spots besides 1 at apices of clavus along posterior margins on each cell. Hindwings tinted with brown along posterior margins . . . . . *P. (H.) elaeagni*  
— Forewings without any markings except for 1 at apices of clavus. Hindwings not brown along posterior margins . . . . . 4.
4. Abdomen green, with margins of segments yellowish green. Body larger, distinctly exceeding 2mm in length . . . . . *P. (H.) hanlabori* sp. nov.  
— Abdomen mostly dark brown. Body smaller, less than 2mm in length . . . . . *P. (H.) elaeagnicola*
5. Antennae longer than 1.8 times or nearly twice as long as width of head including eyes . . . 6.  
— Antennae distinctly shorter than 1.8 times as long as width of head including eyes . . . . 8.
6. Forewings with vein M strikingly curved at proximal half. Hindwings with posterior margin broadest at three-fifths. Male parameres rather straight and subparallel-sided in lateral aspect . . . . . *P. (H.) palgongsana* sp. nov.  
— Forewings with vein M more or less gently curved. Hindwings with posterior margin broadest at near middle. Male parameres slightly bent near base and somewhat narrowed apically in lateral aspect . . . . . 7.
7. Forewings with surface spinules on cell c+sc greatly reduced only leaving at middle. Female proctiger gently narrowed distally, with apex roundly terminated . . . . . *P. (H.) pseudoviburni* sp. nov.



- Forewings with surface spinules on cell c+sc moderately distributed. Female proctiger wavy on dorsal side, with apex slightly upturned . . . . . *P. (H.) juwangsana* sp. nov.
- 8. Antennae longer than 1.4 times as long as width of head including eyes . . . . . 9.
- Antennae shorter than 1.4 times as long as width of head including eyes . . . . . 28.
- 9. Genal cones rather slender and conical, more or less longer than wide at base. Female genitalia longer than wide. . . . . 10.
- Genal cones stout and broad, obliquely truncate apically, nearly as long as wide at base. Female genitalia distinctly shorter than wide . . . . . 27.
- 10. Genal cones about 1.1 times as long as vertex, very slender and strongly divergent. On *Fatsia japonica* . . . . . *P. (H.) fatsiae*
- Genal cones about as long as vertex or shorter, divergent or contiguous. On other host plants . . . . . 11.
- 11. Genal cones about as long as vertex, divergent or contiguous . . . . . 12.
- Genal cones short conical, distinctly shorter than vertex, divergent apically . . . . . 20.
- 12. Forewings with apical margins more or less obliquely rounded, or deeply rounded. Female proctiger very long and slender, with dorsal margin simply straight; length of anus at most about one-third as long as remainder of proctiger . . . . . 13.
- Forewings with apical margins gently rounded. Female proctiger moderately long, with dorsal margin more or less variable; length of anus usually exceeding one-third as long as remainder of proctiger . . . . . 14.
- 13. Forewings with surface spinules greatly reduced, only present in basal cells . . . . .
- . . . . . *P. (H.) seungmoi* sp. nov.
- Forewings with surface spinules moderately distributed throughout membrane . . . . . 15.
- 14. Forewings with apical margins relatively oblique; pterostigma somewhat narrower . . . . .
- . . . . . *P. (H.) intacta*
- Forewings with apical margins less oblique; pterostigma somewhat broader . . . . .
- . . . . . *P. (H.) vondraceki*
- 15. Genal cones slightly contiguous on inner margins . . . . . 16.
- Genal cones divergent apically . . . . . 17.
- 16. Dorsum bloody red to reddish brown; abdomen yellowish green to green. Female proctiger relatively long; length of anus nearly half as long as remainder of proctiger . . . . .
- . . . . . *P. (H.) seonhyeongae* sp. nov.
- Dorsum yellowish brown to orange brown; abdomen greyish brown to dark brown. Female proctiger shorter; length of anus apparently exceeding half as long as remainder of proctiger . . . . . *P. (H.) silvestris* sp. nov.
- 17. Forewings with surface spinules very dense and compact, completely covering membrane . . . . .
- . . . . . *P. (H.) ambigua*
- Forewings with surface spinules sparse or somewhat reduced, leaving broad spinule-free stripes along margins of veins . . . . . 18.
- 18. Surface spinules somewhat reduced. Distal segment of aedeagus slightly shorter than parameres. On *Pittosporum tobira* . . . . . *P. (H.) tobirae*
- Surface spinules moderately or sparsely distributed. Distal segment of aedeagus about as long as or slightly exceeding parameres. On other host plants . . . . . 19.
- 19. Forewings with dark brown spot entirely absent on apex of clavus. On *Rhododendron* spp. . . . . *P. (H.) rhododendri*

- . Forewings with a prominent dark brown spot on apex of clavus. On other host plants  
 ..... 20.
- 20. Body coloring with orange red markings. Male parameres slightly extending on outer side  
 distally in lateral view. Female proctiger with apex more or less sharp, and slightly upturned  
 ..... *P. (H.) seolagsana* sp. nov.
- . Body coloring with yellowish brown markings. Male parameres slightly narrowed distally  
 in caudal view. Female proctiger with apex somewhat roundly terminated .....  
 ..... *P. (H.) koreacola* sp. nov.
- 21. Forewings with surface spinules sparse, clearly visible, not completely covering membrane,  
 usually leaving broad or less broad spinule-free bands along margins of veins ..... 22.
- . Forewings with surface spinules very dense, completely covering membrane, only leaving  
 very narrow spinule free stripes along margins of veins ..... 26.
- 22. Body coloring entirely red or scarle . Genal cones gently and evenly terminated. Forewings  
 with very rarely a dark brown spot at tip of clavus ..... *P. (H.) coccinea*
- . Body coloring not red or scarlet, but pale yellowish brown to dark brown. Genal cones  
 somewhat obliquely blunt apically. Forewings with a prominent dark brown spot at tip of  
 clavus ..... 23.
- 23. Forewings with spinule-free stripes apparently broad ..... 24.
- . Forewings with spinule-free stripes prominent but relatively narrower ..... 25.
- 24. Antennae slightly longer, about 1.7 times as long as width of head including eyes. Genal  
 cones a little slender distally ..... *P. (H.) quelparticola* sp. nov.
- . Antennae not exceeding 1.6 times as long as width of head including eyes. Genal coens  
 somewhat stouter distally ..... *P. (H.) ulleungensis* sp. nov.
- 25. Forewings with 4 brown patches besides 1 at apex of clavus along posterior margin on each  
 cell. Aedeagus with apex rather narrowly produced in lateral shape . . . *P. (H.) bibari* sp. nov.
- . Forewings without posterior marginal patches on each cell excepting dark 1 spot at apex of  
 clavus in young specimen, but with a large brown cloudy pattern in overwintering form.  
 Aedeagus with apex greatly swollen ..... *P. (H.) pyricola*
- 26. Forewings elongate; cubital cell about 1.4 times as wide as high. Male aedeagus with apex  
 bluntly inflated, nearly twice as wide as shaft ..... *P. (H.) jukyungi* sp. nov.
- . Forewings ovate; cubital cell about 1.3 times as wide as high. Male aedeagus with apex  
 moderately terminated, less than twice as wide as shaft ..... *P. (H.) hederæ*
- 27. Forewings with apical margin obliquely rounded, with prominent brown to dark brown linear  
 marking along posterior to apical margin. Male parameres somewhat stout .....  
 ..... *P. (H.) lineaticeps* sp. nov.
- . Forewings with apical margin gently rounded, without striking linear marking along  
 posterior to apical margin, or rarely appearing obscure yellowish brown to brown in older  
 individuals. Male parameres rather slender ..... *P. (H.) abieti*
- 28. Antennae longer than 1.2 times as long as width of head including eyes. Genal cones usually  
 slightly divergent apically or contiguous, somewhat stout or slender ..... 29.
- . Antennae very short, distinctly less than 1.2 times as long as width of head including eyes.  
 Genal cones contiguous in inner margin, slender apically ..... 32.
- 29. Forewings with yellowish brown, reddish brown, or dark pattern in older specimens. Genal  
 cones more or less stout, with apices blunt or truncate ..... 30.
- . Forewings usually transparent, without any prominent color pattern. Genal cones slender  
 apically ..... 31.

30. Genal cones obliquely truncate apically. Forewings transparent, tinted with yellow brown to reddish brown markings. Female proctiger longer; length of anus about half as long as remainder of proctiger . . . . . *P. (H.) truncaticephala* sp. nov.  
 —. Genal cones more or less blunt apically. Forewings mostly dark to black, usually opaque. Female proctiger shorter; length of anus a little shorter than remainder of proctiger . . . . . *P. (H.) obongsana* sp. nov.
31. Male parameres with sharp hook-like processes on basal portion of posterior margins . . . . . *P. (H.) kwonnabiae* sp. nov.  
 —. Male parameres without any processes on basal portion of posterior margins, but simply rounded . . . . . *P. (H.) sangjaei* sp. nov.
32. Antennae slightly exceeding width of head including eyes (usually 1.1 times long). Female proctiger with apex obliquely truncate . . . . . *P. (H.) nopeunsanicola* sp. nov.  
 —. Antennae about as long as width of head including eyes. Female proctiger with apex roundly terminated . . . . . *P. (H.) subcoccinea* sp. nov.

24. *Psylla* (H.) *fulguralis* Kuwayama, 1908 (Myeongbori-namui)

- Psylla fulguralis* Kuwayama, 1908, Trans. Sapp. Nat. Hist. Soc. 2:177-178, pl. 3(17).  
*Psylla fulguralis*: Aulmann, 1913, Psyll. Cat.: 16.  
*Psylla fulguralis*: Kuwayama, 1943, Trans. Nat. Hist. Soc. Taiw. 33:507.  
*Psylla fulguralis*: Sasaki, 1954, Sci. Rep. Mats. Agr. Coll. 14:34.  
*Psylla fulguralis*: Miyatake, 1963, Journ. Fac. Agr. Kyushu Univ. 12(4):342.  
*Psylla fulguralis*: Miyatake, 1964b, Bull. Osaka Mus. Nat. Hist. 17:25.  
*Psylla fulguralis*: Miyatake, 1964c, Rep. Comm. For. Sci. Res. Kyushu Univ. 2:124-125.  
*Psylla fulguralis*: Miyatake, 1965a, Icon. Ins. Jap. Col. nat. ed. 3:148, pl. 74(12).  
*Psylla fulguralis*: Miyatake, 1965b, Kontyu. 33(1):178.  
*Psylla fulguralis*: Miyatake, 1966, Ibid. 34(4): 329.  
*Psylla fulguralis*: Baba et Miyatake, 1971, Bull. Osaka Mus. Nat. Hist. 24:9-10.  
*Psylla fulguralis*: Miyatake, 1972b, Ibid. 26:13-14.  
*Psylla fulguralis* (sic): Klimaszewski, 1973, Ann. Zool. 30(7):207.  
*Psylla fulguralis*: Miyatake, 1976, Lif. Tsushima Is.: 492.  
*Psylla fulguralis*: Miyatake, 1979, Ins. Niigata Pref. 50:220.  
*Psylla fulguralis*: Park et al., 1980a, Nat. & Life 10(1):1-7 (Korea.).  
*Psylla fulguralis*: Park et al., 1980b, Ibid. 10(1):13<sup>4</sup>.  
*Psylla fulguralis*: Lee et Kwon, 1981, Rep. Kor. Ass. Cons. Nat. 19:152<sup>2</sup>.

Type-locality: Japan.

**Description:** General coloration yellowish brown, tinted with somewhat reddish brown markings on dorsum, with abdomen dark brown.

Vertex nearly half as long as wide. Genal cones a little shorter than vertex, somewhat stout conical, divergent apically, with apices sometimes darker in tint, along with sutures. Antennae long, usually exceeding 1.9 times as long as width of head including eyes.

Forewings dark brown with large black markings at tips of clavus, excepting near Culb area which entirely transparent; costal area occasionally slightly lighter in tint.

Male proctiger simple tubular, far longer than parameres. Parameres extended at base, sub-parallel-sided distally, with tips slightly twisted and pointed. Aedeagus very slender near middle portion, more or less arched, with apex and base inflated.

Female proctiger sharply acute apically and strongly upturned; length of anus a little exceed-

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ing half as long as remainder of proctiger.

**Length:** Body male 1.9-2.1mm, female 2.4-2.7mm; to tip of folded wings male 2.8-3.0mm, female 3.1-3.6mm.

**Locality:** GB : Daegu, Gyeongju, Mt. Palgongsan, Mt. Sansungsan (= Mt. Sanseongsan vic. Daegu)<sup>1</sup>, Is. Ulreung (= Is. Ulleungdo; Sadong, Dodong)<sup>2</sup>.

GN : Busan, Is. Geoje, Is. Hansando, Is. Namhaedo, Samnam Myeon, Mt. Weonhyosan.

JJ : Mt. Hanlasan, Jungmun, Seoguiipo.

JN : Is. Daeheugsando, Is. Hongdo, Is. Wando.

**Distribution:** Korea, Japan (Honsu, Kyushu, Shikoku, Ryukyus, Yakushima), Philippines (Mindanao).

**Host-plant:** *Elaeagnus glabra*, *E. macrophylla*.

25. *Psylla* (*H.*) *elaegnii* Kuwayama, 1908 (Galjeombori-namui)

*Psylla elaeagnii* Kuwayama, 1908, Trans. Sapp. Nat. Hist. Soc. 2:164.

*Psylla elaeagnii*: Oshanin, 1910, Ann. Mus. Zool. St. Pet. 15:190.

*Psylla elaeagnii*: Aulmann, 1913, Psyll. Cat.: 14.

*Psylla elaeagnii*: Matsumura, 1916, Appl. Ent. 1:372-373, pl. 14(3).

*Psylla elaeagnii*: Matsumura, 1931, 6000 Ill. Ins. Jap. Emp.: 1276.

*Psylla elaeagnii*: Kuwayama, 1943, Trans. Nat. Hist. Soc. Taiw. 33:509.

*Psylla elaeagnii*: Shinji, 1944, Galls & Gall-Ins.: 444-445.

*Psylla elaeagnii*: Kuwayama, 1950, Icon. Ins. Jap. ed. sec.: 327.

*Psylla elaeagnii*: Sasaki, 1954, Sci. Rep. Mats. Agr. Coll. 14:34.

*Psylla elaeagnii*: Miyatake, 1964a, Journ. Fac. Agr. Kyushu Univ. 13(1): 7-9<sup>①</sup>.

*Psylla elaeagnii*: Miyatake, 1965a, Icon. Ins. Jap. Col. nat. ed. 3:148, pl. 74(13) (Korea).

*Psylla elaeagnii*: Ko, 1969, List for. Ins. Pests Kor.: 24(Korea).

*Psylla elaeagnii*: Kuwayama et Miyatake, 1971, Mushi 45(2): 55 (Korea).

*Psylla elaeagnii*: Miyatake, 1971a, Bull. Osaka Mus. Nat. Hist. 24:1, 2<sup>②</sup>.

*Psylla elaeagnii*: Kor. Soc. pl. Prot., 1972, List Pl. Dis., Ins. Pests, & Weeds Kor.: 122 (Korea).

*Psylla eleagni* (sic): Klimaszewski, 1973, Ann. Zool. 30(7):205.

*Psylla elaeagnii*: Miyatake, 1976, Lif. Tsushima Is.: 492(Korea).

*Psylla elaeagnii*: Okuno et al., 1977, Dis. Pests Cult. Trees & Shrubs Col.: 59.

*Psylla elaeagnii*: Ed. Dep. Hokuryukan, 1979, Ill. Ins. Jap. Stud. ed.: 92 (Korea).

*Psylla elaeagnii*: Park et al., 1979, Nat. & Life 9(2): 108<sup>③</sup>.

*Psylla elaeagnii*: Park et al., 1980b, Ibid. 10(1): 12<sup>④</sup>-⑥.

**Type-locality:** Japan.

**Description:** General coloration yellowish green to olive green, or yellowish brown in older specimens.

Vertex just a little shorter than half as long as wide, with discal impressions rather deep. Genal cones shorter than vertex, more or less stout, divergent apically. Antennae moderately long, about 1.7 times as long as width of head including eyes.

Forewings transparent, with 4 dark spots besides 1 at apex of clavus along posterior margin on each cell. Hindwings rather conspicuously tinted with brown to dark along posterior margin.

Male proctiger gently narrowed and curved to apex in lateral view. Parameres slightly constricted next to basal portions in lateral aspect, with apices somewhat stratificationally narrowed

at posterior margins; tips pointed and directed anterad. Distal segment of aedeagus slightly roundly curved near middle, with apical inflation a rather elongate.

Female proctiger long, with apical portion sharply acute, strongly upturned in lateral aspect; length of anus almost half as long as remainder of proctiger. Subgenital plate much shorter than proctiger, with apex sharp.

**Length:** Body male 1.9-2.2mm, female 2.4-2.7mm; to tip of folded wings male 3.1-3.5mm, female 3.6-3.8mm.

**Locality:** CB : Danyang, Mt. Sogilsan.

CN : Daejeon, Mt. Deongsungsan, Mt. Gyeryongsan.

GB : Mt. Bohyeonsan, Daegu, Dansan Myeon, Dasan Myeon, Mt. Geumosan, Mt. Hwanghagsan, Jungdae (= Jeongdae vic. Daegu)<sup>④</sup>, Mt. Juwangsan, Pagaesa Temple (= Pagyesa Temple vic. Daegu)<sup>⑤</sup>, Mt. Palgongsan, Pohang, Mt. Sobaegsan, Songrimsa Temple (= Songlimsa Temple vic. Daegu)<sup>⑥</sup>, Mt. Sudosan<sup>②</sup>, Mt. Tohamsan, Mt. Unmoonsan (= Mt. Unmunsan)<sup>③</sup>, Urock (= Urog vic. Daegu)<sup>⑦</sup>, Yangnam Myeon, Yongyeonsa Temple<sup>⑧</sup>.

GG : Mt. Chilbosan, Is. Ganghwado, Gwangleung, Seoul, Mt. Soyosan, Suigen (= Suweon)<sup>①</sup>, Mt. Myeongseongsan.

GN : Bangeojin, Busan, Mt. Gajisan, Mt. Gayasan, Is. Geoje, Mt. Geujeongsan, Mt. Jirisan, Masan, Is. Namhaedo, Samnam Myeon, Mt. Sinbulsan, Mt. Weonhyosan, Mt. Yeongchuisan.

GW : Mt. Chiagsan, Chuncheon, Nagsan, Mt. Obongsan, Mt. Odaesan, Mt. Seolagsan.

JB : Mt. Daedunsan, Mt. Deogyusan, Mt. Mayisan, Mt. Naejangsan, Mt. Unjangsan.

JJ : Mt. Hanlasan, Jeju, Jungmun, Manjanggul, Sancheondan, Seoguiipo, Seongsanpo.

JN : Is. Daeheugsando, Is. Hongdo, Mt. Mudeungsan, Is. Wando.

**Distribution:** Korea, Japan (Hokkaido, Honshu, Kyushu, Shikoku, Tsushima, Yakushima), China (Shansi).

**Host-plant:** *Elaeagnus crispa* var. *parvifolia*, *E. glabra*, *E. macrophylla*, *E. umbellata*.

## 26. *Psylla* (H.) *hanlabori* Kwon, sp. nov. (Hanlabori-namui)

**Description:** General coloration yellowish orange, with yellow stripes and markings on dorsum; abdomen green, with each margin of segments yellowish green.

Vertex nearly half as long as wide, with discal impressions deep and prominent located next to posterior margin. Median ocellus prominent, clear. Frons distinctly visible around median ocellus but very narrow. Genal cones, about as long as vertex, divergent apically, with outer sides deeply and somewhat angularly concave; apices blunt, obliquely terminate.

Forewings hyaline, with surface spinules prominent, moderately distributed throughout membrane, only leaving very narrow spinule-free stripes on s+sc and basal portions of each cell; veins brown.

Female genitalia green with apical portion dark brown. Proctiger much longer than subgenital plate, narrowed to apex which sharply acute and strongly upturned; length of anus a little exceeding half as long as remainder of proctiger. Subgenital plate narrowed apically, sharply pointed in lateral aspect.

**Length:** Body female 2.5mm; to tip of folded wings female 3.6mm.

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**Type-examined:** Holotype female, Mt. Hanalsan, JJ, S. Korea, 22, VII, 1981, coll. Y.J. Kwon.

**Remark:** The present new species is apparently separable by the general coloration and the head structure from allied known species.

**Host-plant:** Unknown.

27. *Psylla* (H.) *elaeagnicola* Miyatake, 1963 (Jageunbori-namui)

*Psylla elaeagnicola* Miyatake, 1963, Journ. Fac. Agr. Kyushu Univ. 12(4):352-354.

*Psylla elaeagnicola*: Miyatake, 1969c, Bull. Osaka Mus. Nat. Hist. 22:79.

*Psylla elaeagnicola*: Miyatake, 1971a, Ibid. 24:2-3<sup>①</sup>.

*Psylla elaeagnicola* (sic): Klimaszewski, 1973, Ann. Zool. 30(7):205.

*Psylla elaeagnicola*: Miyatake, 1979, Ins. Niigata Pref. 50:219.

*Psylla elaeagnicola*: Park et al., 1979, Nat. & Life 9(2):108<sup>②</sup>.

*Psylla elaeagnicola*: Park et al., 1980b, Ibid. 10(1):12-13<sup>③-⑤</sup>.

**Type-locality:** Japan.

**Description:** General coloration yellowish brown to reddish brown with dark brown to black markings, with a few pairs of pale yellowish to yellowish brown stripes on dorsum.

Vertex about as long as wide, with discal impressions deep. Genal cones a little shorter than vertex, conspicuously slender, divergent apically, with outer sides deeply concave. Antennae relatively short, about 1.2 times as long as width of head including eyes.

Forewings hyaline, with a brown spot near apex of clavus; veins light brown.

Male proctiger slightly curved and narrowed to apex, longer than parameres. Parameres somewhat roundly concave on basal half of anterior margins, with apical portions a little curved caudad in lateral aspect; tips very shortly blunt, stout. Aedeagus with apex of distal segment somewhat semiovatly inflated; shaft gently narrowed distally.

Female proctiger acutely pointed and strongly upturned apically; length of anus nearly half as long as remainder of proctiger. Subgenital plate with apex slender and sharp in lateral aspect.

**Length:** Body male 1.3-1.5mm, female 1.6-1.9mm; to tip of folded wings male 2.1-2.4mm, female 2.3-2.6mm.

**Locality:** CB : Mt. Sogilsan.

CN : Mt. Deogsungsan, Mt. Gyeryongsan.

GB : Daegu, Dansan Myeon, Gamcheon Myeon, Mt. Geumosan, Mt. Hwanghagsan, Jungdae (= Jeongdae vic. Daegu)<sup>③</sup>, Mt. Juwangsan, Mt. Naeyeonsan, Mt. Palgongsan, Mt. Sansungsan (= Mt. Sanseongsan vic. Daegu)<sup>④</sup>, Mt. Sobaegsan, Mt. Sudosan<sup>①</sup>, Mt. Tohamsan, Mt. Unmoonsan (= Mt. Unmunsan)<sup>②</sup>, Yongyeonsa Temple<sup>⑤</sup>.

GG : Mt. Chilbosan, Gwangleung, Seoul, Suweon.

GN : Mt. Gajisan, Is. Geojedo, Mt. Geumjeongsan, Mt. Jirisan, Masan, Is. Namhaedo, Samnam Myeon, Mt. Sinbulsan, Mt. Weonhyosan, Mt. Yeongchuisan.

GW : Mt. Chiagsan, Mt. Obongsan, Mt. Odaesan, Mt. Seolagsan.

JB : Mt. Mayisan, Mt. Naejangsan, Mt. Unjangsan.

JJ : Mt. Hanlasan, Jeju, Manjanggul.

**Distribution:** Korea, Japan (Honshu, Kyushu, Shikoku).

**Host-plant:** *Elaeagnus crispa* var. *parvifolia*, *E. glabra*, *E. umbellata*.

28. *Psylla* (H.) *palgongsana* Kwon, sp. nov. (Palgongsan-namui)

**Description:** General coloration dirty pale yellow, with brown markings on dorsum and mostly dark brown to black markings on venter and abdomen.

Vertex very slightly shorter than half as long as wide, with deep prominent discal impressions. Genal cones a little longer than vertex, wide at base, with inner margins slightly contiguous; apices dark brown, somewhat obliquely terminated. Antennae very long and slender, nearly twice as long as width of head including eyes, with discal portions of 3rd to 7th segments and apical 3 segments dark brown to black.

Forewings with surface spinules prominent, leaving broad spinule-free bands along margins of veins; vein M strikingly curved at proximal half.

Male proctiger somewhat stout, longer than parameres. Parameres rather stout, relatively broadly parallel-sided, with apices somewhat dully pointed and curved as hook-like anterad. Aedeagus with shaft of distal segment more or less stout; apex less inflated dorsally on near tip.

**Length:** Body male 2.1mm; to tip of folded wings male 3.1mm.

**Type-examined:** Holotype male, Mt. Palgongsan, GB, S. Korea, 21, IV, 1981, coll. Y.J. Kwon.

**Remark:** This new species is easily distinguishable from the allied known species by the long antennae, vein M of forewing which is strikingly curved at proximal half, and especially by the male genitalia.

**Host-plant:** Unknown.

29. *Psylla* (H.) *pseudoviburni* Kwon, sp. nov. (Dume-namui)

**Description:** General coloration pale yellow to yellowish orange, with abdomen yellow green; dorsum of thorax with ocher to orange brown markings.

Vertex distinctly shorter than half as long as wide (ratio, 4: 9), with discal impressions prominent and forming rather transverse furrow. Genal cones long and slender, about as long as vertex, well divergent distally, with outer sides deeply concave. Antennae slender, about twice as long as width of head including eyes, with apical 3 segments dark brown, tips of 5th to 7th segments obscurely brownish.

Forewings rather elongate, with surface spinules present in all cells, leaving broad spinule-free stripes along margins of veins, but in cell c+sc spinules are greatly reduced only leaving at middle; pterostigma very short. Hindwings with posterior margin broadest at near middle.

Male proctiger long, somewhat roundly curved at apex. Parameres relatively slender, slightly bent near base, a little narrowed distally, with apices hook-like and directed anterad. Aedeagus with distal segment slender, about as long as paramere; apex greatly swollen on upper side, more or less pointed backward in lateral shape.

Female proctiger gently narrowed distally, with apex narrow but roundly terminated.

**Length:** Body male 2.1-2.3mm, female 2.3-2.5mm; to tip of folded wings male 3.8-4.0mm, female 4.0-4.2mm.

**Type-examined:** Holotype male, Mt. Seolagsan, GW, C. Korea, 29, VII, 1982, coll. Y.J. Kwon; paratypes: 5 males, 6 females, same data as holotype; 12 males, 15 females, 30, VII, 1982, same locality.

**Remark:** This new species is closely allied to *Psylla viburni* Loew, 1876 in external feature, but

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separable from it by the male and female genitalia.

Host-plant: Unknown.

30. *Psylla* (*H.*) *juwangana* Kwon, sp. nov. (Juwangsan-namui)

Description: General coloration pale yellowish orange to dirty yellowish brown with reddish brown or dark brown markings; abdomen dark brown.

Vertex a little shorter than half as long as wide, with discal impressions prominent and dark brown. Genal cones very long, usually slightly longer than vertex, a little divergent apically. Median ocellus relatively large, with frons invisible. Antennae long, about 1.8 to twice as long as width of head including eyes.

Forewings with surface spinules moderately distributed, leaving slightly broad spinule-free stripes along margins of veins.

Male proctiger longer than parameres. Parameres slightly bent near base and somewhat narrowed distally in lateral aspect, with apices recurved anterad, hook-like. Aedeagus with distal segment somewhat large; shaft more or less stout, with apical inflation rather conically produced in lateral view.

Female proctiger long, with dorsal side wavy; apical portion abruptly narrowed with tip rather roundly terminated; anterior margin extended with a narrow lobe which striate on surface; length of anus well exceeding half as long as remainder of proctiger.

Length: Body male 1.6-1.8mm, female 2.3-2.4mm; to tip of folded wings male 2.9-3.1mm, female 3.2-3.4mm.

Type-examined: Holotype male, Mt. Juwangsan, GB, S. Korea, 19, VII, 1981, on *Salix* sp., coll. Y.J. Kwon; paratypes: 9 males, 8 females, same data as holotype; Mt. Palgongsan, GB, S. Korea, 11 males, 21 females, 2, V, 1982, on *Salix* sp., coll. Y.J. Kwon; Gwangleung, GG, C. Korea, 5 males, 6 females, 14, V, 1982, on *Salix* sp., coll. Y.J. Kwon; Mt. Myeongjisan, GG, C. Korea, 4 males, 6 females, 16, V, 1982, on *Salix* sp., coll. Y.J. Kwon; Mt. Naeyeonsan, GB, S. Korea, 3 males, 9 females, 5, VII, 1982, on *Salix* sp., coll. K.J. Kwon.

Remark: The present new species closely resembles *Psylla ambigua* Foerster, 1848 in general appearance, but is well separated from the latter by the surface spinules on forewing, and by the female proctiger.

Host-plant: *Salix* sp.

31. *Psylla* (*H.*) *fatsiae* Jensen, 1957 (Palsoni-namui)

*Psylla fatsiae* Jensen, 1957, Wasm. Journ. Biol. 15:21.

*Psylla fatsiae*: Miyatake, 1964a, Journ. Fac. Agr. Kyushu Univ. 13(1):13-14.

*Psylla fatsiae*: Miyatake, 1964b, Bull. Osaka Mus. Nat. Hist. 17:25.

*Psylla fatsiae*: Klimaszewski, 1973, Ann. Zool. 30(7):206.

*Psylla fatsiae*: Miyatake, 1976, Lif. Tsushima Is.: 491.

*Psylla fatsiae*: Okuno et al., 1977, Dis. & Pests Cult. Trees & Shrubs Col: 57-58, pl. 15(108).

Type locality: U.S.A. (California).

Description: General coloration pale yellowish orange to olive with somewhat brown markings in young specimens, strikingly developing dark brown to black markings on dorsum with abdomen dark to black in overwintering ones.



Vertex nearly half as long as wide, with discal impressions deep. Genal cones very slender, far longer than vertex, strongly divergent. Antennae 1.6 to 1.7 times as long as width of head including eyes.

Forewings ovate, with surface spinules prominent, leaving spinule-free stripes along margins of veins, and with a dark brown to black patch near apex of clavus. Hindwings with an obscure dark patch near apex of clavus, as in case of forewings.

Male proctiger slightly higher than subgenital plate. Parameres bent near base, with apex strongly narrowed and slightly waved anterad. Aedeagus a little shorter or nearly as long as paramere.

Female proctiger with distal half strikingly narrowed; apex more or less obtuse in lateral aspect; length of anus nearly half as long as or very slightly shorter than half as long as remainder of proctiger.

**Length:** Body male 1.9-2.1mm, female 2.3-2.6mm; to tip of folded wings male 3.4-3.8mm, female 3.6-4.2mm.

**Locality:** GN : Bangeojin, Is. Geojedo, Is. Hansando, Is. Yojido.

JJ : Seoguipo.

**Distribution:** Korea (new record), Japan (Hokkaido, Honshu, Kyushu, Shikoku, Tsushima), U.S.A. (California).

**Host-plant:** *Fatsia japonica*.

### 32. *Psylla* (H.) *seungmoi* Kwon, sp. nov. (Seungmo-namui)

**Description:** General coloration yellowish brown with other brown markings; dorsum of thorax with yellowish brown longitudinal streaks.

Vertex a little shorter than half as long as wide, produced anteriorly, with posterior margin roundly concave; discal impressions prominent and located rather posteriorly. Genal cones typically simple conical, apparently divergent distally, nearly as long as vertex, with outer sides very slightly concave. Antennae about 1.5 times as long as width of head including eyes, with apical 3 segments dark brown to black, tips of 4th to 7th segments somewhat light brown.

Forewings rather elongate, with apical margin more or less obliquely rounded; surface spinules greatly reduced, only partially present in basal cells around claval suture; radular spinules prominently distributed; cubital cell relatively long, about 1.7 to 1.8 times as wide as high; tip of clavus with a brown to dark spot.

Female proctiger much long and slender, with dorsal margin somewhat straight; apex narrowly produced and roundly terminated; length of anus nearly a quarter as long as remainder of proctiger. Subgenital plate apparently shorter than proctiger, with apex narrow and sharp in lateral view.

**Length:** Body female 2.3-2.4mm; to tip of folded wings female 3.5-3.7mm.

**Type-examined:** Holotype female, Mt. Seolagsan, GW, C. Korea, 30, VII, 1982, on *Salix* sp., coll. Y.J. Kwon; paratypes: 3 females, same data as holotype.

**Remark:** This new species is belonging to *Psylla intacta* group but easily separated from them by the forewing structure.

**Host-plant:** *Salix* sp.

33. *Psylla (H.) intacta* Loginova, 1964 (Pungsan-namui)

*Psylla intacta* Loginova, 1964b, Trudy zool. Inst. Akad. Nauk. 34:86-87<sup>①</sup>.

*Psylla intacta*: Loginova, 1966b, Trudy Mold. nauch.-issl. Inst. 13:144.

*Psylla intacta*: Klimaszewski, 1967d, Ann. Univ. Mar. Cur.-Sklod. 21:6 (Korea).

*Psylla intacta*: Loginova, 1967a, Ann. Zool. 24(7):442, 445, 448-449 (North Korea).

*Psylla intacta*: Klimaszewski, 1973, Ann. Zool. 30(7):211 (Korean Peninsula).

*Psylla (Hepatopsylla) intacta*: Loginova, 1978c, Ent. Rev. 57(4):565.

Type-locality: Korea, U.S.S.R. (Kazakhstan).

Description: General coloration green, or pale yellowish brown to olive green.

Vertex slightly shorter than half as long as wide, with discal impressions deep, located before posterior margin to middle. Genal cones rather slender, about as long as vertex, more or less divergent distally; deeply concave at outer sides; with apices somewhat obtuse and subobliquely terminated. Antennae about 1.5 to 1.6 times as long as width of head including eyes.

Forewings elongate, with apical margin obliquely rounded; surface spinules prominent, leaving narrow but distinct spinule-free stripes along margins of veins.

Male proctiger longer than paramere. Parameres strikingly bent near base, narrowed distally, with apex recurved anterad. Aedeagus with distal segment somewhat slender; apex well extended ventrad.

Female proctiger very long and slender, with dorsal margin simply straight; apex roundly terminated; length of anus about one-third as long as remainder of proctiger. Subgenital plate much shorter than proctiger, with apex sharp.

Length: Body male 2.0-2.2mm, female 2.2-2.5mm; to tip of folded wings male 2.9-3.4mm, female 3.0-3.6mm.

Locality: HN : Phunsan (= Pungsan)<sup>①</sup>.

Distribution: Korea, U.S.S.R. (Kazakhstan), Mongolia.

Host-plant: *Salix* sp.

34. *Psylla (H.) vondraceki* Klimaszewski, 1963 (Bugbang-namui)

*Psylla vondraceki* Klimaszewski, 1963e, Ann. Zool. 21(8):67-68.

*Psylla vondraceki*: Loginova, 1964b, Trudy zool. Inst. Akad. Nauk. 34:87-89.

*Psylla vondraceki*: Klimaszewski, 1964c, Ann. Zool. 22(6):153.

*Psylla vondraceki*: Klimaszewski, 1967d, Ann. Univ. Mar. Cur. Sklod. 21:6.

*Psylla vondraceki*: Loginova, 1967a, Ann. Zool. 24(7):442, 445, 448-449 (North Korea).

*Psylla vondraceki*: Klimaszewski, 1968c, Ann. Zool. 25(8):414.

*Psylla vondraceki*: Klimaszewski, 1970a, Ann. Univ. Mar. Cur.-Sklod. 24:223.

*Psylla vondraceki*: Klimaszewski, 1973, Ann. Zool. 30(7):229 (Korean Peninsula).

*Psylla (Hepatopsylla) vondraceki*: Loginova, 1978c, Ent. Rev. 57(4):565.

Type-locality: Mongolia.

Description: General coloration brown to dark brown, with yellowish to yellow brown markings on head and thorax.

Vertex nearly half as long as wide or very slightly less than half as long as wide, with posterior margin roundly concave. Genal cones about as long as vertex, divergent distally, with outer sides slightly concave. Antennae about 1.4 to 1.5 times as long as width of head including eyes, yellowish brown proximally and darker distally.

Forewings about 2.6 times as long as broad, with apical margin deeply round to somewhat obliquely round; surface spinules present in all cells, leaving moderate spinule-free bands along margins of veins; apex of clavus without dark spot.

Male proctiger longer than parameres. Parameres bent near base or deeply concave on basal anterior margin, narrowed apically, with apex recurved. Aedeagus somewhat slender; apex roundly concave on lower side in lateral shape, with tip narrowly but dully produced.

Female proctiger much long and slender, with dorsal margin simply straight; apex slender and narrowly produced, with tip more or less round; length of anus about a quarter as long as remainder of proctiger. Subgenital plate apparently shorter than proctiger, with apex sharply acute.

**Length:** Body male 2.1-2.3mm, female 2.5-2.8mm; to tip of folded wings male 3.1-3.5mm, female 3.5-3.8mm.

**Locality:** North Korea (not given detailed administrative geography) ①.

**Distribution:** Korea, U.S.S.R. (Kazakhstan), Mongolia.

**Host-plant:** *Salix* sp.

### 35. *Psylla* (*H.*) *seonhyeongae* Kwon, sp. nov. (Seonhyeong-namui)

**Description:** General coloration dirty yellow with bloody red markings on vertex, thorax and femora; abdomen light green.

Vertex nearly half as long as wide, with discal impressions prominently deep which tinted dark reddish extending posterior margin. Genal cones about as long as vertex, pale yellowish to yellow, about as long as vertex, slightly obtuse, with inner margins more or less contiguous. Antennae about 1.4 to 1.5 times as long as width of head including eyes, with 2 apical segments dark brown to black.

Forewings elongate, deeply rounded at apical margin, with surface spinules prominent, distributed in all cells leaving moderate spinule-free stripes along margins of veins.

Male proctiger longer than parameres. Parameres abruptly bent at base, nearly straight distally and slightly narrowed; apex shortly truncate. Aedeagus with distal segment long; apex conically produced in lateral aspect.

Female proctiger long and slender, with apex somewhat papilla-like in lateral aspect; length of anus nearly half as long as remainder of proctiger. Subgenital plate relatively long, but shorter than proctiger.

**Length:** Body male 1.6-1.8mm, female 1.9-2.0mm; to tip of folded wings male 2.8-3.1mm, female 3.1-3.2mm.

**Type-examined:** Holotype male, Mt. Juwangsan, GB, S. Korea, 19, VII, 1981, on *Salix* sp., coll. Y.J. Kwon; paratypes; 3 males, 6 females, same data as holotype.

**Remark:** The present new species is well distinguished from allied known species by the coloration, and male and female genitalic structure.

**Host-plant:** *Salix* sp.

### 36. *Psylla* (*H.*) *silvestris* Kwon, sp. nov. (Baegje-namui)

**Description:** General coloration yellowish to yellowish brown with orange markings, and often with dark brown to black markings; abdomen greyish brown to dark brown.

Vertex nearly half as long as wide, with discal impressions roundly deep. Genal cones stout at one-third proximally, somewhat abruptly narrowed apically, as long as or a little longer than

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vertex, slightly contiguous on inner margins, with apices slightly dark brown. Antennae about 1.5 to 1.7 times as long as width of head including eyes, with apical 3 segments and distal portions of 4th to 7th segments dark brown to black.

Forewings with surface spinules dense and compact, only leaving narrow spinule-free stripes along margins of veins.

Male proctiger longer than parameres. Parameres slightly bent near base, with apex recurved as hook-like. Aedeagus with distal segment relatively stout; apex more or less roundly inflated.

Female proctiger slightly wavy on dorsal side in lateral aspect, with apical portion slender; apex less sharp, dorsally convex in lateral aspect; length of anus well exceeding half as long as remainder of proctiger, with apex sharply narrowed.

**Length:** Body male 1.7-1.8mm, female 1.9-2.2mm; to tip of folded wings male 3.1-3.2mm, female 3.4-3.5mm.

**Type-examined:** Holotype male, Mt. Mayisan, JB, S. Korea, 11, V, 1980, coll. Y.J. Kwon; paratypes: 7 males, 11 females, same data as holotype; Mt. Palgongsan, GB, S. Korea, 1 female, 6, VI, 1978, coll. Y.J. Kwon; Mt. Daedunsan, JB, S. Korea, 1 male, 3 females, 29, VI, 1980, coll. Y.J. Kwon.

**Remark:** This new species resembles *Psylla rhododendri* (Puton, 1874), but easily separated from the latter by the surface spinules of forewings, and by the male and female genitalia.

**Host-plant:** Unknown.

37. *Psylla* (*H.*) *ambigua* Foerster, 1848 (*Daeryug-namui*)

*Psylla ambigua* + *P. insignis* Foerster, 1848, Verh. Nat. Ver. Preuss. Rheinl. 3:74, 79.

*Psylla melina* Flor, 1861, Rhynch. Livl. 2:477.

*Psylla insignis*: Meyer-Duer, 1871, Mitth. Schweiz. Ent. Ges. 3:400.

*Psylla stenolabis* Loew, 1876, Pet. nouv. ent. 2:65.

*Psylla ambigua* + *P. stenolabis*: Loew, 1877, Verh. zool.-bot. Ges. Wien. 27:144-146.

*Chermes annellata* Thomson, 1878, Opusc. ent. 8:836.

*Psylla stenolabis*: Reuter, 1881, Ent. Tidskr. 2:157.

*Psylla ambigua*: Loew, 1882, Verh. zool.-bot. Ges. Wien. 32:231.

*Psylla ambigua*: Edwards, 1896, Hem. Hom. Brit. Isl.: 244.

*Psylla ambigua*: Oshanin, 1907, Ann. Mus. Zool. St. Pet. 12:362.

*Psylla ambigua*: Kuwayama, 1908, Trans. Sapp. Nat. Hist. Soc. 2:173.

*Psylla stenolabis*: Sulc, 1909, Wien. Ent. Zeit. 28:24.

*Psylla ambigua*: Aulmann, 1913, Psyll. Cat.: 10.

*Psylla ambigua*: Horváth, 1918, Faun. Reg. Hung. 8:58.

*Psylla insignis*: Haupt, 1935, Tierw. Mitt. 4:x, 235.

*Psylla ambigua*: Schaefer, 1949, Mitt. Schweiz. Ent. Ges. 22(1): 53.

*Psylla ambigua*: Ossiannilsson, 1952, Opusc. Ent. 17:196.

*Psylla insignis*: Smreczynski, 1954, Fragm. Faun. 7:138-139.

*Psylla ambigua*: Sasaki, 1954, Sci. Rep. Mats. Agr. Coll. 14:33.

*Psylla ambigua*: Vondracek, 1957, Faun. CSR. 9:236-238.

*Psylla ambigua*: Lindberg et Ossiannilsson, 1960, Faun. Fenn. 8:14.

*Psylla ambigua*: Dobreanu et Manolache, 1962, Faun. Rep. pop. Rom. Ins. 8(3):231-234.

*Psylla ambigua*: Loginova, 1962b, Trudy zool. Inst. Akad. Nauk. 31:40.

*Psylla ambigua*: Klimaszewski, 1963, Ann. Zool. 21(8): 62.

*Psylla ambigua*: Loginova, 1964a, Keys Ins. Eur. U.S.S.R. 1:467.

*Psylla ambigua*: Miyatake, 1964a, Journ. Fac. Agr. Kyushu Univ. 13(1):18-19.

- Psylla ambigua*: Loginova, 1966b, Trudy Mold. nauchn-issl. Inst. 13:144.  
*Psylla ambigua*: Loginova, 1967a, Ann. Zool. 24(7):434.  
*Psylla ambigua*: Loginova, 1968, Trudy Vses. Ent. Obshch. 52:306.  
*Psylla ambigua*: Klimaszewski, 1970a, Ann. Univ. Mar. Cur.-Sklod. 24:231.  
*Psylla (Hepatopsylla) ambigua*: Ossiannilsson, 1970, Ent. Scand. 1:143.  
*Psylla ambigua*: Klimaszewski, 1971, Fragm. Faun. 17(7): 167.  
*Psylla ambigua*: Klimaszewski, 1973, Ann. Zool. 30(7):200.  
*Cacopsylla ambigua*: Klimaszewski, 1975, Faun. Polsk. 3:195-196.  
*Psylla ambigua*: Hodkinson, 1976, Ent. Gaz. 27:124.  
*Psylla (Hepatopsylla) ambigua*: Loginova, 1978c, Ent. Rev. 57(4):565.  
*Psylla ambigua*: Hodkinson et White, 1979, Handb. Ident. Brit. Ins. 2(5a): 48, 55.  
*Psylla ambigua*: Hodkinson, 1980, Arct. & Alp. Res. 12(3):375.  
*Psylla (Hepatopsylla) ambigua*: White et Hodkinson, 1982, Handb. Ident. Brit. Ins. 2(5b):33.

**Type-locality:** Germany.

**Description:** General coloration pale yellowish green with olive markings, abdomen yellow green to pale green.

Vertex a little shorter than half as long as wide, with discal impressions deep and prominent which located near posterior half. Genal cones as long as or slightly exceeding vertex mesally, more or less divergent apically, convex on inner margins, rather roundly concave on outer margins. Antennae about 1.6 to 1.7 times as long as width of head including eyes.

Forewings somewhat opaque whitish; surface spinules very dense and minute, completely covering membrane.

Male proctiger far longer than parameres, with apex slightly curved posterad. Parameres slender, more or less curved near base to middle, with apices shortly hooked. Aedeagus with distal segment rather stout at apex, conically extended in lateral aspect.

Female proctiger with apex rather dully terminate; length of anus nearly half as long as remainder of proctiger. Subgenital plate strikingly narrowed to apex, and shortly pointed.

**Length:** Body male 1.8-2.1mm, female 2.0-2.3mm; to tip of folded wings male 3.0-3.2mm, female 3.2-3.5mm.

**Locality:** GW : Mt. Obongsan.

**Distribution:** Korea (new record), Japan (Hokkaido, Honshu), whole U.S.S.R. including Siberia, Europe, etc. whole Palaearctica.

**Host-plant:** *Salix* sp.

### 38. *Psylla (H.) tobirae* Miyatake, 1964 (Don-namui)

- Psylla tobirae* Miyatake, 1964a, Journ. Fac. Agr. Kyushu Univ. 13(1):5-7.  
*Psylla tobirae*: Miyatake, 1964c, Rep. Comm. For. Sci. Res. Kyushu Univ. 2:125.  
*Psylla tobirae*: Miyatake, 1965b, Kontyu. 33(1):179.  
*Psylla tobirae*: Miyatake, 1966, Kontyu. 34(4):329.  
*Psylla tobirae*: Klimaszewski, 1973, Ann. Zool. 30(7): 226.  
*Psylla tobirae*: Miyatake, 1976, Lif. Tsushima Is.:492-493.  
*Psylla tobirae*: Miyatake, 1977, Col. Ill. Ins. Jap. 2:163, pl.38(613).  
*Psylla tobirae*: Okuno et al., 1977, Dis. & Pests Cult. Trees & Shrubs Col.: 57, pl.15(106-107).

**Type-locality:** Japan.

**Description:** General coloration pale yellowish green to olive green in young specimens, greenish

brown with rarely dark brown markings in older ones.

Vertex slightly exceeding half as long as wide, with discal impressions prominent. Genal cones about as long as vertex or slightly longer, well divergent and somewhat blunt apically. Antennae about 1.5 times as long as width of head including eyes, with apical 2 segments dark brown to black, apices of 3rd to 8th segments brown to dark.

Forewings elongate, narrowly rounded apically, with surface spinules somewhat reduced, leaving much broad spinule-free areas; veins dark brown in distal half. Male proctiger longer than parameres. Parameres broad at base, with margins almost parallel to blunt apices in lateral aspect; tips truncately hooked. Aedeagus with distal segment slightly shorter than parameres, somewhat broad at base, very slightly and gently narrowed to neck; tip moderately swollen.

Female proctiger very long and slender distally, with apex less sharp and slightly upturned; length of anus about one-third as long as remainder of proctiger.

**Length:** Body male 1.6-1.8mm, female 2.0-2.6mm; to tip of folded wings male 2.9-3.2mm, female 3.2-3.8mm.

**Locality:** JJ : Jeju, Seoguipo.

**Distribution:** Korea (new record), Japan (Honshu, Kyushu, Shikoku, Ryukyus).

**Host-plant:** *Pittosporum tobira*.

39. *Psylla* (H.) *rhododendri* Puton, 1871 (Jindallae-namui).

*Psylla rhododendri* Puton, 1871a, Pet. nouv. Ent. 1:436.

*Psylla rhododendri*: Puton, 1871b, Ann. Soc. Ent. Franc. 1:436.

*Psylla rhododendri*: Loew, 1888, Verh. zool.-bot. Ges. Wien. 38:18.

*Psylla rhododendri*: Dalla Torre, 1892, Ber. nat. med. Ver. Insbr. 20:148.

*Psylla rhododendri*: Oshanin, 1907, Ann. Mus. Zool. St. Pet. 12:359.

*Psylla rhododendri*: Hauard, 1908, Zooc. Plant. Eur.: 788.

*Psylla rhododendri*: Sulc, 1909, Sitz.-BER. Boehm. Ges. Wiss. 22:37.

*Psylla rhododendri*: Aulmann, 1913, Psyll. Cat.: 25-26.

*Psylla rhododendri*: Haupt, 1935, Tierw. Mitt. 4:x, 237-238.

*Psylla rhododendri*: Schaefer, 1949, Mitt. Schweiz. Ent. Ges. 22(1):49-50.

*Psylla rhododendri*: Dobreanu et Manolache, 1962, Faun. Rep. pop. Rom. Ins. 8(3):244-246.

*Psylla rhododendri*: Loginova, 1964a, Keys Ins. Eur. U.S.S.R. 1:469.

*Psylla rhododendri*: Miyatake, 1969c, Bull. Osaka Mus. Nat. Hist. 22:76.

*Psylla rhododendri*: Klimaszewski, 1973, Ann. Zool. 30(7):222-223.

*Cacopsylla rhododendri*: Klimaszewski, 1975, Faun. Polsk. 3:200-201.

*Psylla rhododendri*: Miyatake, 1979, Ins. Niigata Pref. 50:218-219.

*Psylla rhododendri*: Hodkinson, 1980, Arct. & Alp. Res. 12(3):378.

**Type-locality:** Switzerland.

**Description:** General coloration yellowish orange, with brown markings on venter; legs dirty yellow.

Vertex shorter than half as long as wide, with deep discal impressions. Genal cones somewhat stout conical, well divergent apically, usually shorter than or rarely as long as vertex. Antennae about 1.6 to 1.7 times as long as width of head including eyes, with 3 apical segments dark brown to black; apices of 3rd to 7th segments brown.

Forewings somewhat ovate, with surface spinules sparsely distributed leaving broad spinule-free stripes along margins of veins.

Male proctiger somewhat broad, longer than parameres. Parameres slightly bent at base, with apices abruptly narrowed on anterior margins and shortly curved as hook-like. Aedeagus with distal segment a little longer than parameres; apical inflation somewhat elongately extended.

Female proctiger slender distally, with apex a rather roundly terminated; length of anus about half as long as remainder of proctiger. Subgenital plate with apex slender, sharply pointed in lateral aspect.

**Length:** Body male 1.8-2.0mm, female 2.4-2.7mm; to tip of folded wings male 3.2mm, female 3.5-3.9mm.

**Locality:** CN : Mt. Gyeryongsan.

GB : Daegu, Mt. Hwanghagsan, Mt. Juwangsan, Mt. Palgongsan, Mt. Sobaegsan.

GN : Mt. Gajisan, Mt. Sinbulsan, Mt. Weonhyosan, Mt. Yeongchuisan.

JB : Mt. Deogyusan, Mt. Mayisan, Mt. Unjangsan.

JN : Mt. Mudeungsan.

**Distribution:** Korea (new record), Japan (Honshu), Austria, Czechoslovakia, Germany, Rumania, Switzerland, U.S.S.R. (N. European Part, Ukraina, Transcarpathia).

**Host-plant:** *Rhododendron* spp.

#### 40. *Psylla* (H.) *seolagsana* Kwon, sp. nov. (*Seolagsan-namui*)

**Description:** General coloration dirty yellowish brown to ocher brown, with abdomen dark brown markings; legs dirty yellow.

Vertex about half as long as wide, produced anterad. Genal cones relatively slender, about as long as vertex, strikingly divergent distally, with apices somewhat obliquely terminated, deeply concave on outer sides. Antennae long, about 1.6 to 1.7 times as long as width of head including eyes, with apical 2 or 3 segments dark brown.

Forewings somewhat elongate, with a dark brown spot on apex of clavus; surface spinules present in all cells, leaving moderate spinule-free stripes along margins of veins; pterostigma moderately long.

Male proctiger recurved distally in lateral shape. Parameres shorter than proctiger, broad at base, narrowed near middle, roundly extending on outer side of distal portion in caudal view; with apex narrow and shortly pointed. Aedeagus with distal segment more or less slender; apex elongately less swollen on upper side.

Female proctiger with apex somewhat sharply pointed and slightly upturned; length of anus nearly half as long as remainder of proctiger. Subgenital plate apparently shorter than proctiger, with apex sharply pointed in lateral shape.

**Length:** Body male 1.9-2.1mm, female 2.1-2.4mm; to tip of folded wings male 3.5-3.8mm, female 3.7-3.9mm.

**Type-examined:** Holotype male, Mt. Seolagsan, 1650-1700m, GW, C. Korea, 29, VII, 1982, on *Pinus pumila*, coll. Y.J. Kwon; paratypes: 3 males, 3 females, same data as holotype; 10 males, 7 females, 30, VII, 1982, same locality.

**Remark:** The present new species is closely allied to *Psylla amabilis* Ossiannilsson, 1975, but separated from it by the male and female genitalia.

**Host-plant:** *Pinus pumila*.

41. *Psylla (H.) koreacola* Kwon, sp. nov. (Uri-namui)

**Description:** General coloration yellowish orange, with orange red markings; abdomen mostly reddish brown; genital segments yellowish brown.

Vertex nearly half as long as wide, with orange red markings; discal impressions deeply concave, located posteriorly. Genal cones slender, about as long as vertex, strikingly divergent distally, with apices somewhat obliquely terminated, with outer sides deeply concave. Antennae about 1.6 times as long as width of head including eyes, with apical 2 or 3 segments dark brown.

Forewings widest at apical third, with a dark brown spot on apex of clavus; surface spinules present in all cells, leaving moderate spinule-free stripes along margins of veins; pterostigma gently long.

Male proctiger relatively long and slender, slightly curved distally. Parameres shorter than proctiger, roundly concave on basal half of anterior side in lateral shape, with posterior side more or less straight; apex less sharply recurved. Aedeagus with apex less subacutely produced; distal segment as long as or slightly exceeding parameres.

Female proctiger gently narrowed distally, with apex more or less roundly terminated; length of anus nearly half as long as remainder of proctiger. Subgenital plate much shorter than proctiger, with apex sharply pointed in lateral aspect.

**Length:** Body male 1.7-1.8mm, female 1.9-2.0mm; to tip of folded wings male 3.0-3.1mm, female 3.2-3.3mm.

**Type-examined:** Holotype male, Mt. Seolagsan, 1650-1700m, GW, C. Korea, 30, VII, 1982, coll. Y.J. Kwon; paratypes: 1 male, 12 females, same data as holotype.

**Remark:** This new species has a resemblance to *Psylla myrtilli* Wagner, 1947, but distinguished from it by the male genitalia.

**Host-plant:** Unknown.

42. *Psylla (H.) coccinea* Kuwayama, 1908 (Eureum-namui)

*Psylla coccinea* Kuwayama, 1908, Trans. Sapp. Nat. Hist. Soc. 2:171-172.

*Psylla coccinea*: Aulmann, 1913, Psyll. Cat.:14.

*Psylla coccinea*: Kuwayama, 1931, Ins. Mats. 5(3):127-128.

*Aphalara akebiae* Shinji, 1942c, Ins. World. 46:354.

*Aphalara akebiae* (sic) + *P. coccinea*: Shinji, 1944, Galls & Gall-Ins.:440-441, 443-444.

*Psylla coccinea*: Kuwayama, 1950, Icon. Ins. Jap. ed. sec.: 325.

*Psylla akebiae* + *P. coccinea*: Sasaki, 1954, Sci. Rep. Mats. Agr. Coll. 14:33-34.

*Psylla coccinea*: Miyatake, 1964a, Journ. Fac. Agr. Kyushu Univ. 13(1):15-16.

*Psylla coccinea*: Miyatake, 1964b, Bull. Osaka Mus. Nat. Hist. 17:25.

*Psylla coccinea*: Miyatake, 1965a, Icon. Ins. Jap. Col. nat. ed. 3:148, pl. 74(11).

*Psylla coccinea*: Miyatake, 1965b, Kontyu. 33(1):176.

*Psylla coccinea*: Miyatake, 1966, Ibid. 34(4):328.

*Psylla coccinea*: Miyatake, 1969c, Bull. Osaka Mus. Nat. Hist. 22:77-78.

*Psylla coccinea*: Miyatake, 1971a, Ibid. 24:2<sup>⊕</sup>.

*Psylla coccinea*: Baba et Miyatake, 1971, Ibid. 24:9.

*Psylla coccinea*: Klimaszewski, 1973, Ann. Zool. 30(7):203.

*Psylla coccinea*: Miyatake, 1976, Lif. Tsushima Is.: 491(Korea).

*Psylla coccinea*: Miyatake, 1977, Col. Ill. Ins. Jap. 2:162, pl.38(610) (Korea).

*Psylla coccinea*: Ed. Dep. Hokuryukan, 1979, Ill. Ins. Jap. Stud. ed.: 92 (Korea).

*Psylla coccinea*: Miyatake, 1979, Ins. Niigata Pref. 50:219.



*Psylla coccinea*: Park et al., 1979, Nat. & Life 9(2):108-109<sup>②</sup>.

*Psylla coccinea*: Park et al., 1980b, Nat. & Life 10(1):14<sup>③-⑥</sup>.

Type-locality: Japan.

**Description:** General coloration yellowish red to scarlet in young specimens, bloody red to reddish brown with dark or black markings in overwintering forms; legs lighter in tint.

Vertex nearly half as long as wide. Genal cones stout, distinctly shorter than vertex, well divergent distally, with apices somewhat dully terminated. Antennae about 1.6 times as long as width of head including eyes, with apical 2 segments dark brown to black.

Forewings transparent, slightly tinted with yellow; surface spinules prominent leaving broad spinule-free bands along margins of veins; veins yellow, yellowish red or yellowish brown; usually without dark spot at tip of clavus, but visible in overwintering forms.

Male proctiger relatively short, but exceeding parameres. Parameres bent near base, tapering to apices which curved as hook-like. Aedeagus with distal segment nearly as long as parameres; apex elongately swollen and curved downwards in lateral aspect.

Female proctiger a rather dull at apex, with dorsal side more or less wavy in lateral aspect; length of anus hardly exceeding half as long as remainder of proctiger.

**Length:** Body male 1.6-1.8mm, female 2.1-2.9mm; to tip of folded wings male 2.6-3.0mm, female 3.0-3.6mm.

**Locality:** CB : Danyang, Mt. Soglisun.

CN : Mt. Deogsungsan, Mt. Gyeryongsan.

GB : Mt. Bohyeonsan, Daegu, Donghwasan Temple <sup>③</sup>, Gyeongju, Hayang Eub, Mt. Hwanghagsan, Mt. Juwangsan, Mt. Naeyeonsan, Pagaesa Temple (= Pagyesa Temple vic. Daegu)<sup>④</sup>, Mt. Palgongsan, Mt. Sobaegsan, Songrimsa Temple (= Songlimasa Temple vic. Daegu)<sup>⑤</sup>, Mt. Sudosan <sup>①</sup>, Mt. Tohamsan, Mt. Unmoonsan (= Mt. Unmunsan)<sup>②</sup>, Yongyeonsa Temple <sup>⑥</sup>.

GG : Mt. Chilbosan, Is. Ganghwado, Gwangleung, Mt. Myeongseongsan, Seoul, Suweon.

GN : Busan, Mt. Cheonhwangsan, Mt. Gajisan, Mt. Gayasan, Is. Geoje, Mt. Jirisan, Masan, Is. Namhaedo, Samnam Myeon, Tongdosa Temple, Mt. Weonhyosan.

GW : Mt. Chiagsan, Mt. Odaesan, Mt. Seolagsan.

JB : Mt. Daedunsan, Mt. Deogyusan, Mt. Mayisan, Mt. Naejangsan.

JJ : Mt. Hanlasan, Jeju, Seongsanpo.

JN : Is. Daheugsando, Is. Hongdo, Mt. Mudeungsan, Is. Wando.

**Distribution:** Korea, Japan (Hokkaido, Honshu, Kyushu, Shikoku, Ryukyus), Taiwan.

**Host-plant:** *Akebia quinata*.

#### 43. *Psylla* (*H.*) *quelparticola* Kwon, sp. nov. (Tamla-namui)

**Description:** General coloration pale yellow and slightly tinted with yellowish green, with brown to dark brown markings.

Vertex about half as long as wide, with discal impressions prominent and located next to middle. Genal cones distinctly shorter than vertex, somewhat stout, well divergent distally, with apices rather dully pointed. Antennae about 1.7 times as long as width of head including eyes, with apical 2 segments black, apices of 4th to 8th segments dark brown.

Forewings broadest in apical third, moderately rounded apically, transparent tinted with somewhat milky white, with a prominent dark spot at tip of clavus; veins light brownish; surface

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spinules prominent, leaving broad spinule-free bands along margins of veins.

Abdomen mostly developed with dark brown patches. Male proctiger long, slightly and gently curved posterad. Parameres broadest and bent at base, tapered to apices in lateral view, with tips sharply curved. Aedeagus with distal segment very slender, nearly as long as parameres or subgenital plate; apex somewhat subangularly swollen, with dorsal tip produced.

**Length:** Body male 2.0mm; to tip of folded wings male 3.4mm.

**Type-examined:** Holotype male, Jeju, JJ, S. Korea, 11, V, 1982, coll. Y.J. Kwon.

**Remark:** The present new species is well separable from other related known species by the male genitalic structure.

**Host-plant:** Unknown.

44. *Psylla* (*H.*) *ulleungensis* Kwon, sp. nov. (Ulleung-namui)

**Description:** General coloration pale yellow to dirty yellow, or pale yellowish brown, somewhat tinted with yellowish green with brown markings.

Vertex slightly shorter than half as long as wide, with discal impressions deep and located next to middle. Genal cones slightly shorter than vertex, rather stout, blunt at apices, well divergent distally. Median ocellus orange in color, somewhat deeply located at inner base of genal cones. Antennae about 1.5 to 1.6 times as long as width of head including eyes, with apical 2 segments dark brown, apices of 4th to 8th segments brown.

Forewings with a dark spot at apex of clavus; surface spinules prominent, somewhat sparsely covering, leaving, very broad spinule-free bands along margins of veins. Hindwings rather narrowly rounded apically.

Male proctiger long, with base produced on dorsal side, slightly curved apically. Parameres broadest at base, with tips abruptly narrowed on anterior margin forming a hook. Aedeagus with distal segment more or less slender; apex elongately curved in lateral aspect.

Female proctiger with apex slightly roundly terminated; length of anus distinctly exceeding half as long as remainder of proctiger. Subgenital plate much shorter than proctiger.

**Length:** Body male 1.9mm, female 2.1-2.3mm; to tip of folded wings male 3.1-3.2mm, female 3.1-3.6mm.

**Type-examined:** Holotype male, Is. Ulleungdo, GB, S. Korea, 1, X, 1981, coll. Y.J. Kwon; paratypes: 1 male, 3 females, same data as holotype.

**Remark:** This new species is well different from other known species by the male and female genitalic structure.

**Host-plant:** Unknown.

45. *Psylla* (*H.*) *bibari* Kwon, sp. nov. (Bibari-namui)

**Description:** General coloration pale yellowish green or pale yellowish brown with dark markings.

Vertex very slightly shorter than half as long as wide, with discal impressions prominent and located rather posteriorly; posterior margin a little roundly concave. Antennal sockets bulging at base of genal cones. Genal cones distinctly shorter than vertex, somewhat regular conical, prominently divergent distally. Antennae about 1.7 to 1.8 times as long as width of head including eyes, with apical 2 segments black; apices of 5th to 8th segments dark brown.

Forewings elongate, deeply rounded apically, with 4 brown patches besides 1 at tip of clavus along posterior margin on each cell; veins concolorous with membrane; surface spinules prominent,

leaving relatively narrow spinule-free stripes along margins of veins. Hindwings transparent, without any coloration on hind margins.

Male proctiger long, with apical portion strikingly bent in lateral view. Parameres broad and bent at base, anterior margin somewhat blade-like, slightly narrowed to apices, with tips shortly hooked. Aedeagus with distal segment slender and long; apex poorly swollen, with dorsal tip narrowly produced in lateral aspect.

**Length:** Body male 2.2mm; to tip of folded wings male 3.6mm.

**Type-examined:** Holotype male, Jungmun, JJ, S. Korea, 11, V, 1982, coll. Y.J. Kwon.

**Remark:** This new species resembles *Psylla elaeagni* Kuwayama, 1908, in forewing coloration, but easily distinguishable from the latter by the hindwings as well as male genitalia.

**Host-plant:** Unknown.

#### 46. *Psylla* (H.) *pyricola* Foerster, 1848 (Ggomabae-namui)

*Psylla pyricola* + *P. apiophila* + *P. simulans* + *P. argyrostigma* Foerster, 1848, Verh. Nat. Ver. Preuss. Rheinl. 3:77, 78, 80, 97.

*Psylla notata* Flor, 1861, Kat. Rhynch.: 365.

*Psylla pyricola* + *P. apiophila*: Meyer-Duer, 1871, Mitth. Schweiz. Ent. Ges. 3:396.

*Psylla apiophila*: Loew, 1877, Verh. zool.-bot. Ges. Wien. 27:137.

*Psylla pyricola*: Scott, 1883, Ent. Monthl. Mag. 19:205-206.

*Psylla pyricola*: Loew, 1886, Verh. zool.-bot. Ges. Wien. 36:156.

*Psylla pyricola*: Edwards, 1896, Hem. Hom. Brit. Isl.: 240, pl. 27(2).

*Psylla pyricola*: Sulc, 1901, Cas. Cesk. Spol. Ent. 2:1.

*Psylla pyricola*: Oshanin, 1907, Ann. Mus. Zool. St. Pet. 12:352.

*Psylla pyricola*: Kuwayama, 1908, Trans. Sapp. Nat. Hist. Soc. 2:163.

*Psylla pyricola*: Sulc, 1909, Sitz.-Ber. Boehm. Ges. Wiss. 22:34.

*Psylla pyricola*: Oshanin, 1910, Ann. Mus. Zool. St. Pet. 15:189.

*Psylla pyricola*: Aulmann, 1913, Psyll. Cat.: 24.

*Psylla pyricola* + *P. simulans*: Sulc, 1915, Rozpr. C. Ak. Cis. Fr. Jos. 24:5-8, 18-21.

*Psylla pyricola*: Matsumura, 1916, Appl. Ent. 1:372.

*Psylla pyricola* + *P. simulans*: Horváth, 1918, Faun. Reg. Hung. 8:58.

*Psylla pyricola*: Haupt, 1935, Tierw. Mitt. 4:x, 238.

*Psylla pyricola*: Schaefer, 1949, Mitt. Schweiz. Ent. Ges. 22(1):33.

*Psylla pyricola*: Ossiannilsson, 1952, Opusc. Ent. 12:198.

*Psylla pyricola*: Sasaki, 1954, Sci. Rep. Mats. Agr. Coll. 14:35.

*Psylla pyricola*: Vondracek, 1957, Faun. CSR. 9:276-281.

*Psylla pyricola*: Dobreanu et Manolache, 1962, Faun. Rep. pop. Rom. Ins. 8(3):187-192.

*Psylla pyricola* + *P. simulans*: Loginova, 1964a, Keys. Ins. Eur. U.S.S.R. 1:467.

*Psylla pyricola*: Loginova, 1968, Trudy vses. Ent. Obshch. 52:302.

*Psylla* (*Hepatopsylla*) *pyricola*: Ossiannilsson, 1970, Ent. Scand. 1:143.

*Psylla pyricola*: Klimaszewski, 1971, Fragm. Faun. 17(7):171.

*Psylla pyricola*: Klimaszewski, 1973, Ann. Zool. 30(7):221.

*Psylla pyricola*: Hodkinson, 1974, Bull. Ent. Res. 64:328, 330-331.

*Cacopsylla pyricola*: Klimaszewski, 1975, Faun. Polsk. 3:159-161.

*Psylla pyricola*: Hodkinson, 1976, Ent. Gaz. 27:125.

*Psylla* (*Hepatopsylla*) *pyricola*: Loginova, 1978c, Ent. Rev. 57(4):565.

*Psylla pyricola*: Hodkinson et White, 1979, Handb. Ident. Brit. Ins. 2(5a):43, 48, 58.

*Psylla pyricola*: Hodkinson et Hollis, 1981, Ent. Scand. 12:65.

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*Psylla pyricola*: Hodkinson et White, 1981, Journ. Nat. Hist. 15:491, 507.

*Psylla (Hepatopsylla) pyricola*: White et Hodkinson, 1982, Handb. Ident. Brit. Ins. 2(5b):33.

Type-locality: Germany.

Description: General coloration varied, olive green to reddish brown, or brown to dark brown in overwintering individuals.

Vertex about half as long as wide. Genal cones often slightly shorter than vertex, but more or less variable, stout, divergent distally, with apices somewhat obliquely blunt. Antennae long, about 1.7 to 1.9 times as long as width of head including eyes.

Forewings somewhat elongate, with a dark patch around apex of clavus; surface spinules prominent leaving spinule-free stripes along margins of veins; membrane clear to slightly yellowish in summer specimens, having obscure brown cloudy pattern in overwintering ones; cubital cell short, about 1.4 to 1.5 times as wide as high.

Male proctiger longer than parameres or subgenital plate. Parameres relatively short, with apices simply narrowed and abruptly terminate. Aedeagus with distal segment about as long as parameres; apex greatly swollen dorsally.

Female genitalia very short. Proctiger very slightly sinuate on dorsal side near middle, with apex dully terminated; length of anus usually exceeding half as long as remainder of proctiger. Subgenital plate much less than proctiger, with apex sharply pointed.

This species is an important pest of pear tree, and is known as a vector of fireblight in N. America.

Length: Body male 1.8-2.0mm, female 2.0-2.3mm; to tip of folded wings male 2.7-3.0mm, female 3.0-3.3mm.

Locality: GG : Mt. Myeongseongsan.

GW : Mt. Seolagsan.

Distribution: Korea (new record), Japan (Hokkaido, Honshu), whole U.S.S.R., Europe, etc. Palaearctica, N. America.

Host-plant: *Pyrus communis*, *P. ussuriensis*.

#### 47. *Psylla* (H.) *jukyungi* Kwon, sp. nov. (Jukyungbae-namui)

Description: General coloration pale yellowish green to olive green in young specimens, mostly reddish brown to dark brown with light longitudinal streaks on dorsum of thorax in overwintering ones.

Vertex nearly half as long as wide. Genal cones usually shorter than vertex, stout, well divergent distally. Antennae relatively long, about 1.6 to 1.7 times as long as width of head including eyes, with apical 3 segments dark brown; often apices of 4th to 7th segments brown.

Forewings somewhat elongate, with surface spinules dense and compact, leaving narrow spinule-free stripes along margins of veins; membrane sometimes slightly milky white in tint; in overwintering specimens veins dark brown, often with obscure brown cloudy pattern on membrane; cubital cell usually short, about 1.4 times as wide as high.

Male proctiger long, more or less roundly curved apically, broad basally. Parameres a little slender, with tips somewhat finger-like, abruptly narrowed at anterior margin, dully pointed and slightly directed anterad. Aedeagus with apex peculiarly swollen; apical margin roundly terminated.

Female genitalia very short. Proctiger with dorsal side wavy near middle; apex dully narrow-ed; length of anus greatly exceeding half as long as remainder of proctiger. Subgenital plate much

shorter than proctiger.

**Length:** Body male 1.5-1.8mm, female 1.8-2.6mm; to tip of folded wings male 2.4-2.8mm, female 2.8-3.3mm.

**Type-examined:** Holotype male, Samnam Myeon, GN, S. Korea, 7, VI, 1981, on *Pyrus communis* in orchard, coll. Y.J. Kwon; paratypes; 3 males, 4 females, same data as holotype; 1 female, 10, V, 1981, same locality; 1 male, 3 females, 21, III, 1982, Same locality.

**Remark:** Although the present new species is resembled to *Psylla pyricola* Foerster, 1848, in external feature, the former is apparently distinguished from the latter by the forewing structure and coloration, and is also separated by the male genitalia. This new species was all found by me feeding on pear trees at orchards in Samnam Myeon, Ulju Gun County, where is cultivated many pear orchards and thus famous with high products of the fruits in Korea, both teneral and overwintering individuals were collected respectively.

**Host-plant:** *Pyrus communis*.

#### 48. *Psylla* (*H.*) *hederae* Miyatake, 1964 (Songag-namui)

*Psylla hederae* Miyatake, 1964a, Journ. Fac. Agr. Kyushu Univ. 13(1):16-18.

*Psylla hederae*: Miyatake, 1964b, Bull. Osaka Mus. Nat. Hist. 17:26.

*Psylla hederae*: Baba et Miyatake, 1971, Ibid. 24:10.

*Psylla hederae*: Klimaszewski, 1973, Ann. Zool. 30(7):209.

*Psylla hederae*: Miyatake, 1976, Lif. Tsushima Is.: 490-491.

*Psylla hederae*: Miyatake, 1979, Ins. Niigata Pref. 50:220.

**Type-locality:** Japan.

**Description:** General coloration yellowish green in young specimens, yellowish brown in older ones, with abdomen more or less greenish in tint.

Vertex nearly half as long as wide. Genal cones distinctly shorter than vertex, divergent distally, stout, about as long as wide at base, somewhat dully terminated. Antennae about 1.5 times as long as width of head including eyes, with 2 apical segments dark brown to black.

Forewings ovate, broadly rounded apically, with surface spinules very dense and almost completely covering in all cells, only leaving very slightly narrow spinule-free stripes along margins of veins.

Male proctiger far longer than parameres. Parameres bent at base, with apices shortly curved as hook-like. Aedeagus with distal segment more or less slender; apex elongately swollen and curved in lateral aspect.

Female proctiger with apex slightly extending, somewhat truncately rounded; length of anus nearly half as long as remainder of proctiger.

**Length:** Body male 1.7-1.9mm, female 2.0-2.4mm; to tip of folded wings male 2.5-2.8mm, female 2.8-3.1mm.

**Locality:** GB : Is. Ulleungdo.

JJ : Mt. Hanlasan, Jeju, Jungmun, Sancheondan.

**Distribution:** Korea (new record), Japan (Honshu, Kyushu, Shikoku, Tsushima).

**Host-plant:** *Hedera rhombea*.

49. *Psylla* (*H.*) *lineaticeps* Kwon, sp. nov. (Geomeunddi-namui)

**Description:** General coloration yellowish green, with dorsum of thorax reddish brown to brown markings in older specimens.

Vertex very slightly exceeding half as long as wide, with discal impressions located next to middle. Genal cones stout, contiguous, obliquely truncate apically, on same plane with vertex, nearly as long as wide at base. Antennae about 1.5 to 1.6 times as long as width of head including eyes, with apical 2 segments and apices of 4th to 8th segments dark brown.

Forewings obliquely rounded apically, with prominent dark brown linear markings along posterior to apical margins; surface spinules prominent, moderately distributed in all cells only leaving very narrow spinule-free stripes along margins of veins.

Male proctiger recurved caudad. Parameres broad at base, with apices minute teeth-like. Aedeagus greatly swollen at apex, with shaft relatively slender.

Female genitalia very short, nearly as long as wide. Proctiger with apex more or less dull; length of anus a little exceeding half as long as remainder of proctiger.

**Length:** Body male 2.3-2.4mm, female 2.4-2.6mm; to tip of folded wings male 3.5-3.7mm, female 3.7-4.0mm.

**Type-examined:** Holotype male, Mt. Obongsan, GW, C. Korea, 17, V, 1981, on *Acer* sp., coll. Y.J. Kwon; paratypes: 5 males, 8 females, same data as holotype; 15 males, 21 females, 20, V, 1982, on *Acer* sp., same locality; Mt. Juwangsan, GB, S. Korea, 5 males, 9 females, 19, VII, 1981, on *Acer* sp., coll. Y.J. Kwon; Mt. Soyosan, GG, C. Korea, 2 males, 1 female, 15, V, 1982, coll. Y.J. Kwon; Mt. Seolagsan, GW, C. Korea, 4 males, 3 females, 27, VII, 1982, coll. Y.J. Kwon.

**Remark:** The present new species resembles *Psylla abieti* Kuwayama, 1908, in head structure, but easily separated from the latter by the brown markings on dorsum and forewings, as well as male genitalia.

**Host-plant:** *Acer* sp.

50. *Psylla* (*H.*) *abieti* Kuwayama, 1908 (Dampung-namui)

*Psylla abieti* + *P. albopontis* Kuwayama, 1908, Trans. Sapp. Nat. Hist. Soc. 2:164-165, 175-176.

*Psylla abieti*: Oshanin, 1910, Ann. Mus. Zool. St. Pet. 15:194.

*Psylla abieti*: Aulmann, 1913, Psyll. Cat.:8.

*Psylla abieti*: Matsumura, 1916, Appl. Ent. 1:373, pl. 14(2).

*Psylla abieti*: Matsumura, 1931, 6000 Ill. Ins. Jap. Emp.: 1275.

*Psylla abieti*: Kuwayama, 1950, Icon. Ins. Jap. ed. sec.: 326.

*Psylla abieti* + *P. albopontis*: Sasaki, 1954, Sci. Rep. Mats. Agr. Coll. 14:33.

*Psylla abieti*: Miyatake, 1964a, Journ. Fac. Agr. Kyushu Univ. 13(1):9-10.

*Psylla abieti*: Miyatake, 1964b, Bull. Osaka Mus. Nat. Hist. 17:24-25.

*Psylla abieti*: Miyatake, 1969c, Ibid. 22:72.

*Psylla abieti*: Miyatake, 1971a, Ibid. 24:2<sup>①</sup>.

*Psylla abieti*: Baba et Miyatake, 1971, Ibid. 24:9.

*Psylla abieti*: Kuwayama et Miyatake, 1971, Mushi 45(2):53.

*Psylla abieti*: Miyatake, 1972a, Mem. Nat. Sci. Mus. Tokyo. 5:102.

*Psylla abieti*: Klimaszewski, 1973, Ins. Niigata Pref. 50:216.

*Psylla abieti*: Miyatake, 1979, Ins. Niigata Pref. 50:216.

*Psylla abieti*: Park et al., 1980b, Nat. & Life 10(1):11<sup>②-④</sup>.

*Psylla abieti*: Lee et Kwon, 1981, Rep. Kor. Ass. Cons. Nat. 19:152<sup>⑤</sup>.

Type-locality: Japan.

**Description:** General coloration pale yellowish orange to greenish orange in young specimens, yellowish brown to orange brown in older specimens, with abdomen mostly bright green.

Vertex nearly as long as wide, with discal impressions located near middle. Genal cones shorter than vertex, contiguous, somewhat broad, blunt and obliquely truncate apically, on same plane with vertex. Antennae about 1.5 times to 1.6 times as long as width of head including eyes, with apical 2 segments and apices of 4th to 8th segments dark brown.

Forewings gently rounded apically, only with posterior margins obscurely tinted with orange brown in summer and autumn specimens; surface spinules very dense, completely covering in all cells.

Male proctiger strikingly curved at apex in lateral view. Parameres broad at base, with apices abruptly narrowed at one side and truncately terminated. Aedeagus rather slender, with apex subquadrately swollen and curved downwards.

Female genitalia a little shorter than wide. Proctiger with apex somewhat dull.

It is probable that this species spend its immature stage feeding on mapple trees in springtime and immigrate to abies-furs in summertime after fully grown.

**Length:** Body male 2.1-2.4mm, female 2.4-2.6mm; to tip of folded wings male 3.2-3.5mm, female 3.6-3.8mm.

**Locality:** CB : Danyang, Mt. Soglisian.

CN : Mt. Deogsungsan, Mt. Gyeryongsan.

GB : Daegu, Dansan Myeon, Donghwasan Temple ②, Mt. Hwanghagsan, Mt. Juwangsan, Mt. Naeyeonsan, Pagaesa Temple (= Pagyesa Temple vic. Daegu) ③, Mt. Palgongsan, Mt. Sobaegsan, Mt. Sudosan ①, Mt. Tohamsan, Is. Ulreung (= Is. Ulleungdo; Naridong, Sadong) ⑤, Yeongcheon, Yongyeonsa Temple ④.

GG : Is. Ganghwado, Gwangleung, Seoul, Mt. Soyosan, Suweon.

GN : Busan, Mt. Gajisan, Mt. Gayasan, Mt. Geumsan, Mt. Jirisan, Samnam Myeon, Mt. Sinbulsan, Tongdosa Temple, Mt. Weonhyosan.

GW : Mt. Chiagsan, Mt. Obongsan, Mt. Odaesan, Mt. Seolagsan.

JB : Mt. Daedunsan, Mt. Deogyusan, Mt. Naejangsan.

JJ : Mt. Hanlasan.

**Distribution:** Korea, Japan (Hokkaido, Honshu, Kyushu, Shikoku).

**Host-plant:** *Abies* spp., *Acer* spp.

# **51. *Psylla* (*H.*) *truncaticephala* Kwon, sp. nov. (Dongbaeg-namui)**

**Description:** General coloration yellow with ocher to reddish brown markings.

Vertex about as long wide, with discal impressions located near middle; median suture dark brown. Genal cones somewhat broad, shorter than vertex, slightly contiguous, peculiarly obliquely truncate. Antennae relatively short, about 1.2 to 1.25 times as long as width of head including eyes, with apical 2 segments and apices of 4th to 8th segments dark brown.

Forewings yellowish, with yellowish brown to reddish brown cloudy pattern on distal half; apex of clavus brown; surface spinules very dense, completely covering in all cells.

Male proctiger roundly curved at middle in lateral view. Parameres bent near base in lateral aspect, more or less narrow, with apices shortly pointed. Aedeagus with distal segment roundly arched near middle; base and apex dully swollen.

Female proctiger with apical third abruptly narrowed; apex dully terminated; length of anus about half as long as remainder of proctiger.

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**Length:** Body male 1.7-1.9mm, female 2.1-2.3mm; to tip of folded wings male 2.4-2.6mm, female 2.7-2.9mm.

**Type-examined:** Holotype male, Is. Hongdo, JN, S. Korea, 11, VIII, 1981, on *Camellia japonica*, coll. Y.J. Kwon; paratypes: 8 males, 22 females, same data as holotype; Is. Yoggido, GN, S. Korea, 1 male, 9, X, 1980, coll. Y.J. Kwon.

**Remark:** The above new species is well distinguished from *Psylla japonica* Kuwayama, 1955, by the forewing venation and male genitalia.

**Host-plant:** *Camellia japonica*.

52. *Psylla* (H.) *obongsana* Kwon, sp. nov. (Obongsan-namui)

**Description:** General coloration mostly dark brown to black, with yellow patches on basal portions of antennae, legs, wings, and often on venter.

Vertex about half as long as wide, with discal impressions located rather posteriorly; disc distinctly inflated at a little before center. Genal cones broad and stout, contiguous, far less than vertex, blunt apically. Antennae about 1.2 to 1.3 times as long as width of head including eyes.

Forewings dark brown to black, opaque, only around on stem R+M+Cu1 pale yellow; surface spinules very minute, dense and compact, completely covering in all cells; veins relatively broad.

Male proctiger longer than parameres, more or less straight in lateral aspect. Parameres broad at base, somewhat straight and slightly narrowed distally, with apices bluntly pointed. Aedeagus with apex roundly swollen, recurved downwards in lateral view.

Female genitalia very short. Proctiger abruptly narrowed distally, with apex less sharp; length of anus a little shorter than remainder of proctiger.

**Length:** Body male 1.7-1.8mm, female 1.9-2.0mm; to tip of folded wings male 2.7-2.9mm, female 3.2-3.3mm.

**Type-examined:** Holotype male, Mt. Obongsan, GW, C. Korea, 17, V, 1981, coll. Y.J. Kwon; paratypes: 1 male, 2 females, same data as holotype; Mt. Myeongseongsan, GG, C. Korea, 1 female, 16, V, 1982, coll. Y.J. Kwon.

**Remark:** The present new species is easily separated from other known species by the external coloration and male genitalia.

**Host-plant:** Unknown.

53. *Psylla* (H.) *kwonnabiae* Kwon, sp. nov. (Kwonnabi-namui)

**Description:** General coloration yellowish green to olive green, with abdomen more tinted with green.

Vertex a little shorter than half as long as wide, with discal impressions prominent and located rather posteriorly. Genal cones slightly less than vertex, a little divergent, with apices somewhat blunt and obliquely terminate; outer sides deeply concave. Antennae about 1.3 to 1.4 times as long as width of head including eyes, with apical 3 to 4 segments dark brown or black.

Forewings elongate, with veins brown at distal half; surface spinules prominent and relatively sparsely distributed, leaving narrow spinule-free stripes along margins of veins.

Male proctiger long, strikingly curved at apex in lateral view. Parameres somewhat broad, with a sharp hook-like process on inner side of basal posterior margins; apex round, with posterior tip very shortly truncate. Aedeagus with apex somewhat bluntly produced.

Female genitalia strikingly long. Proctiger with distal half abruptly narrowed; apex more or



less dully terminated; length of anus not exceeding one-third as long as remainder of proctiger. Subgenital plate slender, with apex very sharp in lateral aspect.

**Length:** Body male 1.7-1.8mm, female 2.0-2.1mm; to tip of folded wings male 3.0-3.2mm, female 3.3-3.5mm.

**Type-examined:** Holotype male, Mt. Obongsan, GW, C. Korea, 17, V, 1981, on *Salix* sp., coll. Y.J. Kwon; paratypes; 6 males, 9 females, same data as holotype; 1 male, 20, V, 1982, same locality; Mt. Myeongseongsan, GG, C. Korea, 4 males, 6 females, 16, V, 1982, on *Salix* sp., coll. Y.J. Kwon.

**Remark:** This new species resembles *Psylla initialis* Loginova, 1966 and *P. sibirica* Loginova, 1966 in external feature, but distinctly separated from them by the male genitalic characters.

**Host-plant:** *Salix* sp.

54. *Psylla* (H.) *sangjaei* Kwón, sp. nov. (Sangjae-namui)

**Description:** General coloration dirty yellowish green, with mostly dark brown markings due to overwintering specimen.

Vertex about half as long as wide, with posterior margin more or less roundly concave; discal impressions prominent and deep, located rather posteriorly; median suture slightly deep at anterior half. Genal cones much shorter than vertex, slightly contiguous, bluntly terminated apically, a little lower than vertex in plane; outer sides concave. Antennae about 1.3 to 1.4 times as long as width of head including eyes, darker to distally.

Forewings elongate, with veins brown; membrane semitransparent, creamy white in tint; surface spinules sparse, partly reduced, leaving broad spinule-free bands along margins of veins.

Male proctiger relatively narrow, roundly curved at middle in lateral view. Parameres somewhat broad, distinctly shorter than proctiger, bent at base, very slightly recurved at middle in lateral shape, with apex shortly produced on posterior end. Aedeagus with distal segment greatly swollen at apex and base; apical margin roundly terminated in lateral aspect.

**Length:** Body male 1.4mm; to tip of folded wings male 2.57mm.

**Type-examined:** Holotype male, Mt. Myeongseongsan, GG, C. Korea, 16, V, 1982, coll. Y.J. Kwon.

**Remark:** The above new species is easily distinguished from other allied species by the male genitalia.

**Host-plant:** Unknown.

55. *Psylla* (H.) *nopeunsanicola* Kwon, sp. nov. (Nopeunsan-namui)

**Description:** General coloration yellowish brown to orange brown with dark brown to black markings.

Vertex about half as long as wide, with discal impressions deep and located a little posteriorly. Genal cones distinctly shorter than vertex, contiguous, slender apically. Antennae usually 1.1 times as long as width of head including eyes, darker to distally.

Forewings elongate, with veins brown to dark brown; membrane somewhat creamy white, with surface spinules prominent, relatively sparse, leaving narrow spinule-free stripes along margins of veins.

Male proctiger relatively short, narrowed and bent at apical portion in lateral view. Parameres peculiar in shape, broad at base; anterior margin slightly extended at middle and tapering apically,

Y.J. KWON: Psylloidea of Korea

posterior margin more or less straight except at apex which curved anterad in lateral aspect; tips obliquely truncate. Aedeagus a little slender, with apex archedly swollen.

Female proctiger long, abruptly narrowed distally, with apex somewhat obliquely truncate and slightly upturned; dorsal side a little wavy; length of anus less than half as long as remainder of proctiger.

**Length:** Body male 1.5-1.6mm, female 1.9mm; to tip of folded wings male 2.9-3.0mm, female 3.1-3.2mm.

**Type-examined:** Holotype male, Mt. Hanlasan, 1900-1930m, JJ, S. Korea, 22, VII, 1981, on *Abies* sp., coll. Y.J. Kwon; paratypes: 1 male, 3 females, same data as holotype; Mt. Seolagsan, GW, C. Korea, 10 males, 12 females, 30, VII, 1982, on *Abies* sp., coll. Y.J. Kwon.

**Remark:** This new species is readily distinguished from allied species by the peculiar male genitalia.

**Host-plant:** *Abies* sp.

56. *Psylla* (H.) *subcoccinea* Kwon, sp. nov. (Deodeumijjalbeun-namui)

**Description:** General coloration yellowish orange with dorsum reddish orange; abdomen reddish brown.

Vertex slightly less than half as long as wide, with discal impressions deep located at next to posterior margin. Genal cones distinctly shorter than vertex, contiguous on inner side, with outer margin slightly concave. Antennae strikingly short, about as long as width of head including eyes, brown to dark brown basally, dark brown to black apically.

Forewings elongate, transparent, with veins brown; pterostigma very long; surface spinules dark brown distally, prominent, distributed in all cells, nearly completely covering; apex of clavus without any dark spot.

Male proctiger longer than parameres. Parameres more or less recurved, slightly narrowed apically in lateral view, with dully produced obscure short cone on each outer side of base. Aedeagus slender at neck portion, with apex gently rounded on dorsal side.

Female genitalia relatively long, Proctiger with distal portion markedly narrowed; apex roundly terminated; dorsal side gently arched dorsad in lateral aspect; length of anus about half as long as remainder of proctiger. Subgenital plate much shorter than proctiger, with apex sharp in lateral aspect.

**Length:** Body male 1.4-1.5mm, female 1.8-1.9mm; to tip of folded wings male 2.4-2.5mm, female 2.8-2.9mm.

**Type-examined:** Holotype male, Mt. Seolagsan, GW, C. Korea, 30, VII, 1982, on *Abies* sp., coll. Y.J. Kwon; paratypes: 20 males, 18 females, same data as holotype; Mt. Daedunsan, JB, S. Korea, 29, VI, 1980, coll. Y.J. Kwon.

**Remark:** The present new species is related to *Psylla sibirica* group, but separated well from them by the male and female genitalia.

**Host-plant:** *Abies* sp.

Family IV. SPONDYLIASPIDAE Schwarz, 1898 (Keunpaeng-namui-gwa)

Head usually strikingly vertical, forming an angle of almost 90° with plane of thorax, deflexed, often narrower than mesothorax.

Vertex generally large and flat, slightly quadrate with anterior margin more or less roundly

curved, shorter than wide. Genal cones often broad at base, divergent or contiguous apically, well developed, shorter than vertex. Frons reduced, enveloped between bases of genal cones, bearing median ocellus prominent. Eyes more or less spherical, often with ocular sclerites extended forward to form small pre-occipital lobes between eye and antennal socket, or entirely absent.

Thorax large and broad. Forewings rhomboidal or oval to elongate, membranous or slightly thick, sometimes with markings; pterostigma present or rarely absent; costal vein with or without gap. Basal metatarsus with or without saltatorial spines.

Male proctiger usually peculiar in shape, often bipartite. Parameres and aedeagus varied. Female genitalia wedge shaped, or often circular in lateral aspect, varied in length.

Generally represented mainly in Australia and New World. Little is known about the group, and we need more extensive investigation of the world fauna.

#### Subfamily PACHYPSYLLINAE Crawford, 1914 (Keunpaeng-namui-agwa)

Head, pronotum, and praescutum somewhat vertically inclined, with mesothorax exceedingly thick dorso-ventrally; anterior part of head about on same level with venter of mesothorax, vertex very large, flat, somewhat square in shape. Genal cones often well developed, subconical, shorter than vertex. Frons generally invisible, enveloped between bases of genal cones, with median ocellus prominent. Eyes typically convex, without pre-occipital lobes between eye and antennal socket. Antennae shorter or moderately exceeding width of head including eyes.

Thorax very large; mesonotum ascending vertically to scutum. Forewings rhomboidal or elongate oval, subhyaline or often more or less opaque, with pterostigma absent or rarely present; costal vein with or without gap. Legs thick; basal metatarsus usually armed with 2 saltatorial spines.

Male genitalia varied. Proctiger with or without posterior process. Parameres rather broad or slender. Female genitalia usually wedge shaped or often peculiarly roundly terminated.

Widely distributed in Palaearctica, Nearctica, and Australia. In Palaearctica 13 species belonging to 3 genera have been known, including a single species from Far East Asia.

#### Genus 13. *Pachypsylla* Riley, 1885 (Keunpaeng-namui-sog)

*Pachypsylla* Riley, 1885, Proc. Biol. Soc. Wash. 2:71.

Type-species: *Psylla venusta* Osten-Sacken, 1861

Type-locality: U.S.A.

Head generally small, narrower than thorax, vertically inclined with praescutum. Vertex very large, almost square, flat except apical margin rounded down. Genal cones small to strikingly developed, hardly exceeding vertex, depressed strongly from plane of vertex. Frons invisible, enveloped between bases of genal cones, with median ocellus small to prominent. Eyes somewhat spherical, extending well beyond lateral extremities of post-orbital ridges. Antennae shorter or exceeding width of head including eyes.

Thorax large and broad, strongly arched. Forewings more or less rhomboidal or elongate oval, often slightly thick and opaque, generally variously colored and maculated, with marginal cells elongate; pterostigma present or absent; veins usually setigerous. Legs rather short; hindtibia armed with at most 11 saltatorial spines at apex; basal metatarsus armed with 2 saltatorial spines laterally.

Male proctiger with posterior margin more or less broadly inflated, and bearing a typical epiphysis apically. Female genitalia wedge shaped or often peculiarly roundly terminated.

Generally associated with hackberries entirely composed of gall-makers.

57. *Pachypsylla japonica* Miyatake, 1968 (Keunpaeng-namui)

Psyllidae sp.: Kim, 1965, Res. Bull. Chinju Agr. Coll. 4:53 ①-②.

Psyllidae sp.: Kim, 1967, Journ. Ins. Agr. Res. Util. Chinju Agr. Coll. 1:90 ②.

*Pachypsylla japonica* Miyatake, 1968a, Bull. Osaka Mus. Nat. Hist. 21:5-12, pl. 1.

*Pachypsylla japonica*: Klimaszewski, 1973, Ann. Zool. 30(7):186.

*Pachypsylla japonica*: Miyatake, 1977, Col. Ill. Ins. Jap. 2:161-162, pl. 38(608) (Korea).

*Pachypsylla japonica*: Lee et Kwon, 1981, Rep. Kor. Ass. Cons. Nat. 19:152 ③.

Type-locality: Japan.

**Description:** General coloration ochre brown to dark brown with pale yellow to dirty yellow markings.

Vertex yellowish or reddish brown with a pair of shiny dark brown to black patterns; anterior margin dark brown. Genal cones broad, slightly divergent, blunt apically, somewhat shorter than vertex. Antennae slender, about 1.4 times as long as width of head including eyes, light brown with 2 apical segments dark. Ocelli orange. Head small, about two-thirds as wide as thorax, vertical.

Forewings rather thick, coriaceous, dark brown and opaque, with transparent portions on clavi; pterostigma absent; costal vein without gap.

Male proctiger stout, roundly extending caudad, with a prominent apical epiphysis. Parameres broad at base, narrowed to apices, with tips directed entad. Aedeagus enlarged at apex, with basal segment broad at apical half.

Female proctiger peculiar, very short and broad, semicircular in lateral shape, furnished with numerous long curling hairs along posterior margin. Subgenital plate much shorter than proctiger, with acute apex.

**Length:** Body male 2.3-2.7mm, female 2.5-3.1mm; to tip of folded wings male 4.1-4.3mm, female 4.5-5.1mm.

**Locality:** CN : Mt. Gyeryongsan.

GB : Daegu, Mt. Hwanghagsan, Mt. Juwangsan, Mt. Naeyeonsan, Mt. Palgongsan, Is. Ulreung (= Is. Ulleungdo; Jeodong) ③, Unsu Myeon, Yangnam Myeon.

GG : Gwangleung, Seoul, Suweon.

GN : Busan, Chinju (= Jinju) ②, Mt. Gajisan, Mt. Jirisan ①, Samnam Myeon, Mt. Yeongchuisan.

GW : Mt. Chiagsan, Mt. Odaesan, Mt. Seolagsan.

JB : Mt. Daedunsan.

**Distribution:** Korea, Japan (Honshu, Hokkaido), China (Shanghai).

**Host-plant:** *Celtis sinensis* var. *japonica*.

Family V. CARSIDARIDAE Crawford, 1914 (Sotae-namui-gwa)

Head often deeply cleft in front, shorter than wide, nearly as wide as thorax. Genae variable in form, sometimes swollen into small or larger conical processes beneath antennal sockets, sometimes not at all swollen, or forming typical genal cones but shorter than vertex. Frons usually reduced and enveloped by bases of genal cones, or sometimes not covered and easily visible between them, bearing median ocellus prominent. Eyes strikingly convex, more or less spherical. Antennae usually long and slender. Often much thickened or very short, rarely markedly flattened.

Thorax more or less arched. Forewings usually membraneous, oval or elongate or rarely point-

ed at apex; pterostigma absent or present; veins often bearing long setae, M and Cu1 with common stem arising from R. Hindtibia often with a genual spine at base; basal metatarsus with or without saltatorial spines laterally.

Male proctiger simple tubular, or often bipartite. Parameres and aedeagus varied. Female genitalia more or less wedge shaped.

Generally distributed in the tropical region. Hitherto 4 genera under 3 subfamilies have been known from Palaearctica.

#### Subfamily CALOPHYINAE Vondracek, 1957 (Sotae-namui-agwa)

Body generally small to medium size. Head about as wide as thorax, rather vertical, shorter than wide. Vertex wide or elongate, often elevated or arched anteriorly, with discal impressions sometimes obscurely present. Genal cones well divergent, shorter than vertex, rarely reduced to only broadly produced margins of genae. Frons usually invisible or rarely retaining between bases of genal cones, bearing median ocellus prominent. Eyes convex, extending beyond lateral extremities of post-orbital ridges, without pre-occipital lobes between eye and antennal socket. Antennae usually short, less than width of head including eyes; basal 2 segments large, swollen; each segment of flagellum markedly short, with 2 long apical setae.

Forewings oblong-oval, roundly terminated, membranous and transparent; pterostigma well developed; with radular spinules present; cell cu1 usually large and elongate.

Hindtibia without genual spine at base; basal metatarsus entirely lacking saltatorial spines.

Male proctiger simple tubular. Aedeagus usually flat and broad laterally. Female genitalia wedge shaped.

Known only single genus represented in Holarctic, Neotropical, and Oriental Regions. Recently transferred into the above family from Psyllidae by Bekker-Migdisova (1973) based on the nymphal structure, and Hodkinson (1980a, 1980b) also followed the alternation.

#### Genus 14. *Calophya* Loew, 1879 (Sotae-namui-sog)

*Calophya* Loew, 1879, Verh. zool.-bot. Ges. Wien. 28:598.

Type-species: *Psylla rhois* Loew, 1878

Type-locality: Austria.

Head about as wide as thorax, somewhat vertical. Vertex usually wider than long, or rarely elongate in subgenus *Neocalophya* Miyatake, often elevated and arched anteriorly. Genal cones short conical or flattened dorso-ventrally, or rarely reduced to only broadly produced margins of genae. Frons invisible or leaving small sclerite retaining between bases of genal cones, bearing median ocellus prominent. Antennae short, scarcely exceeding width of head including eyes; distal segments often knotty, with 2 long apical setae.

Forewings transparent, membranous, with radular spinules distinctly present; pterostigma broad and long; costal gap present; cell cu1 strikingly larger and higher in size than m2. Hindtibia armed with 4 to 6 saltatorial spines at apex; basal metatarsus without saltatorial spines.

Male proctiger tubular, without posterior process. Parameres shorter than proctiger, usually narrowed to apex. Aedeagus somewhat flat and broad laterally; distal segment more or less bent or slightly constricted at middle, with apex not markedly or typically swollen on upper side, but rather evenly roundly terminated; proximal segment with base not roundly curved, but rather straight. Female genitalia wedge shaped, length varied.

In Palaearctica 7 species have been known to occur.

Key to species of *Calophya*

1. Genal cones vertical, very short and broadly stout, less than half as long as median length of vertex . . . . . *C. verticornis* sp. nov.  
— Genal cones not vertical, more or less conical, moderately slender, distinctly longer than half as long as median length of vertex . . . . . 2.
2. Body coloring dark brown to black with yellow to light brown markings on dorsum. Forewings with apical margins somewhat subangularly rounded . . . . . *C. nigra*  
— Body coloring yellowish green, often with ochre to reddish brown markings on dorsum in older specimens. Forewings with apical margins gently rounded . . . . . *C. shinji*

58. *Calophya verticornis* Kwon, sp. nov. (Geumsan-namui)

**Description:** General coloration dirty yellowish green, with dark brown markings on head and dorsum.

Vertex somewhat obliquely curved at anterior half, with posterior margin angularly concave. Genal cones vertical, broadly stout, shorter than half as long as median length of vertex, peculiar in shape, tinted with yellowish green. Median ocellus prominent. Antennae pale yellow, distinctly shorter than head width including eyes, with apical 3 segments dark brown to black.

Forewings elongate, slightly tinted with yellow, broadest at next to apices; surface spinules very dense, completely covering membrane.

Female proctiger long, slender, with distal portion sharply terminated; middle of dorsal margin bearing with several long hairs; length of anus slightly exceeding half as long as remainder of proctiger. Subgenital plate long subtriangular, with sharp tip in lateral aspect, shorter than proctiger.

**Length:** Body female 1.7mm; to tip of folded wings female 2.0mm.

**Type-examined:** Holotype female, Mt. Geumsan, GN, S. Korea, 29, III, 1982, coll. Y.J. Kwon.

**Remark:** The present new species differs well from other known species by the shape of genal cones which are vertical and broadly stout.

**Host-plant:** Unknown.

59. *Calophya nigra* Kuwayama, 1908 (Geomjeongsotae-namui)

*Calophya nigra* Kuwayama, 1908, Trans. Sapp. Nat. Hist. Soc. 2:160.

*Calophya nigra*: Oshanin, 1910, Ann. Mus. Zool. St. Pet. 15:189.

*Calophya nigra*: Aulmann, 1913, Psyll. Cat.: 6.

*Calophya nigra*: Sasaki, 1954, Sci. Rep. Mats. Agr. Coll. 14:30.

*Calophya nigra*: Miyatake, 1969c, Bull. Osaka Mus. Nat. Hist. 22:69.

*Calophya nigra*: Klimaszevski, 1973, Ann. Zool. 30(7): 187.

*Calophya nigra*: Miyatake, 1979, Ins. Niigata Pref. 50:215.

*Calophya nigra*: Park et al., 1980b, Nat. & Life. 10(1):15<sup>①</sup>.

**Type-locality:** Japan.

**Description:** General coloration dark brown to black, often with yellowish to light brown markings on dorsum.

Vertex black, with posterior margin yellowish tint. Genal cones pale yellow to dirty yellow, short conical, distinctly divergent at base, shorter than vertex at median length. Frons invisible,

enveloped between bases of genal cones, bearing median ocellus prominent. Eyes dark brown to black. Antennae about as long as width of head including eyes, dirty yellowish brown to ochre brown, apical 2 segments dark to black, bearing with long apical setae.

Pronotum with yellowish markings on anterior margin; scutellum usually yellowish to ochre brown. Forewings elongately oval, about 2.5 times as long as broad, with apical margin somewhat subtriangularly narrowed; veins white; pterostigma long and well developed; cell *cul* greatly larger and elongater than *m*<sub>2</sub>.

Male proctiger nearly as long as subgenital plate, longer than parameres. Female genitalia about as long as remainder of abdomen.

**Length:** Body male 1.2-1.4mm, female 1.5-1.8mm; to tip of folded wings male 2.5-2.8mm, female 2.8-3.0mm.

**Locality:** GB : Mt. Sansungsan (= Mt. Sanseongsan vic. Daegu) <sup>①</sup>.

**Distribution:** Korea, Japan.

**Host-plant:** *Phellodendron amurense*, *Picrasma quassioides*.

#### 60. *Calophya shinji* Sasaki, 1954 (Sotae-namui)

*Psylla sorbii* Shinji, 1944, Galls & Gall-Ins.: 448 nom. praeoc.

*Calophya shinji* Sasaki, 1954, Sci. Rep. Mats. Agr. Coll. 14:31.

*Calophya shinji*: Baba et Miyatake, 1971, Bull. Osaka Mus. Nat. Hist. 24:8.

*Calophya shinji* (sic): Klimaszewski, 1973, Ann. Zool. 30(7):188.

*Calophya shinji* (sic): Miyatake, 1979, Ins. Niigata Pref. 50:215.

*Calophya viridis* (nec Kuwayama): Park et al., 1980b, Nat. & Life 10(1):15 <sup>①</sup>.

*Calophya viridis* (nec Kuwayama): Lee et Kwon, 1981, Rep. Kor. Ass. Cons. Nat. 19:152 <sup>②</sup>.

**Type-locality:** Japan.

**Description:** General coloration yellowish green in young specimens, ochre to reddish brown on dorsum in older ones with abdomen yellowish green.

Vertex about half as long as wide; disc slightly elevated. Genal cones shorter than vertex, somewhat light in tint. Antennae distinctly shorter than width of head including eyes, with apical 2 segments dark to black.

Forewings with pterostigma prominently long; cell *cul* nearly 2.5 times as large as *m*<sub>2</sub>.

Male proctiger a little shorter than subgenital plate, longer than parameres, simple tubular. Parameres subtriangular in lateral aspect, with a prominent short spine-like tooth on middle of posterior margin inward, with 3 teeth on near anterior margin. Aedeagus with proximal segment angularly bent near middle; distal segment somewhat stout, slightly bent at middle; basal portion with wing-like processes stretched laterad; apical portion laminate, somewhat broad laterally.

Female genitalia relatively short; length of anus about as long as remainder of proctiger.

**Length:** Body male 1.7-1.9mm, female 1.9-2.0mm; to tip of folded wings male 2.8-3.0mm, female 3.0-3.1mm.

**Locality:** GB : Daegu, Mt. Palgongsan, Is. Ulreung (= Is. Ulleungdo; Mt. Seonginbong) <sup>②</sup>, Yongyeonsa Temple <sup>①</sup>.

GG : Suweon.

**Host-plant:** *Picrasma quassioides*; temporally on *Cryptomeria japonica*, *Pinus densiflora*, *Sorbus commixta*.

Family VI. TRIOZIDAE Loew, 1879 (Chang-namui-gwa)

Head moderately deflexed, scarcely as broad as thorax. Vertex generally subtriangular to semicircular in outline, seldom flat, with prominent median suture; discal impressions usually deep. Genal cones generally well developed, or rarely rudimental. Frons enveloped between bases of genal cones except small portion bearing median ocellus. Eyes strikingly convex, with occipital lobes absent. Antennae 10 segmented, variable in length.

Prothorax typically well arched. Pleurites unequal. Forewings more or less angulate at apex, sometimes narrowly rounded; pterostigma and costal gap absent; veins Cul and M not having common stem, each arising separately from common origin at vein R; gap in anal vein some distance from apex of vein Culb. Hindtibia generally with or without genual spine at base, with 3 to 4 saltatorial spines at apex; basal metatarsus without saltatorial spines laterally.

Male proctiger often with posterior margin broadly extended or subtriangularly produced. Female genitalia usually wedge shaped, varied in length.

Generally a very large family of worldwide distribution, feeding on a variety of host plants of trees, shrubs, grasses and herbs. In Palaearctica hitherto more than 140 species belonging to 9 genera are known to occur.

Key to tribes of Korean Triozidae

1. Apex of forewings located above termination of vein  $M_{1+2}$ . Vein M shorter than 2 branches ( $M_{1+2}$ ,  $M_{3+4}$ ). Vein  $M_{1+2}$  subparallelled with  $M_{3+4}$ . Cells m2 and cu1 somewhat parallelogramy ..... *Epitrozini* triv. nov.  
 —. Apex of forewings located below termination of vein  $M_{1+2}$ , or rarely above termination. Vein M longer than 2 branches ( $M_{1+2}$ ,  $M_{3+4}$ ). Vein  $M_{1+2}$  more or less divergent with  $M_{3+4}$ . Cells m2 and cu1 somewhat subtriangular ..... 2.
2. Genal cones clavate in dorsal view, slightly constricted at base. Forewings with distinct color pattern ..... *Trichohermini*  
 —. Genal cones not clavate in dorsal view, broadest at base. Forewings without color pattern, usually transparent ..... *Trioziini*

Tribe EPITRIOZINI Kwon, trib. nov. (Ginbori-namui-jog)

Head generally small, somewhat vertical, narrower than thorax. Vertex subquadrate, shorter than wide, with discal impressions present, more or less flat. Genal cones shorter than vertex, usually vertical, well developed, slightly divergent apically, with broad base, lower than plane of vertex. Frons rudimental, enveloped between bases of genal cones, bearing with median ocellus prominent. Eyes less convex, hemispherical, extending well beyond lateral extremities of post-orbital ridges. Antennae usually short, slightly exceeding width of head including eyes.

Thorax large, convex. Pronotum almost vertical, slightly narrower than head. Forewings membranous, usually transparent, with subangulate apex located above termination of vein  $M_{1+2}$ ; vein M shorter than 2 branches ( $M_{1+2}$ ,  $M_{3+4}$ );  $M_{1+2}$  usually subparallelled with  $M_{3+4}$ ; Cula subparallelled with Culb; cells m2 and cu1 elongate and large, somewhat parallelogramy. Hindwings peculiar, with vein R arising from basal vein first, M and Cul with common stem as in psylline. Hindtibia without genual spine at base, with 3 saltatorial spines at apex; basal metatarsus without saltatorial spines; meracanthus short.

Generally restricted in Korea and Japan associated with *Elaeagnus*.



Genus 15. *Epitrioza* Kuwayama, 1910 (Ginbori-namui-sog)*Epitrioza* Kuwayama, 1910, Trans. Sapp. Nat. Hist. Soc. 3:55-56.Type-species: *Epitrioza mizuhonica* Kuwayama 1910

Type-locality: Japan.

Head small, narrower than thorax, somewhat vertical and slightly deflexed. Vertex subquadrate, with posterior margin rather straight, distinctly longer than half as long as wide; discal impressions prominent. Genal cones short, about half as long as vertex, with blunt or subacute apices, slightly divergent. Antennae slightly exceeding width of head including eyes.

Forewings long and broad, transparent and membranous, with subangulate apex located above termination of vein  $M_{1+2}$ ; Rs strikingly long, terminating nearly next to apex of wing; stem M shorter than 2 branches;  $M_{1+2}$  usually subparalleled with  $M_{3+4}$ ; Cula subparalleled with Culb; cells m2 and cu1 strongly elongate and large, forming more or less subparallelogramy. Hindwings with vein R peculiarly present which arising from basal vein trunk first; M and Cu with common stem. Hindtibia without conspicuous genual spine at base, with 1 outer and 2 inner saltatorial spines at apex; basal metatarsus without saltatorial spines laterally.

Male proctiger longer than parameres; posterior margin more or less broadly rounded, with long pubescence. Parameres usually narrow, more or less parallel margined. Female proctiger with apex sharply acute and often conspicuously upturned.

A small Far East Asiatic genus comprising only 3 species feeding on *Elaeagnus*.

Key to species of *Epitrioza*

1. Apices of forewings located nearly in the middle of terminations of veins Rs and  $M_{1+2}$ . Male parameres slender, with an acute apex curved anterad . . . . . *E. mizuhonica*
- Apices of forewings located distinctly closer to terminations of vein  $M_{1+2}$ . Male parameres somewhat stout, sinuate basally, with apex directed caudad . . . . . *E. yasumatsui*

61. *Epitrioza mizuhonica* Kuwayama, 1910 (Ginbori-namui)*Epitrioza mizuhonica* Kuwayama, 1910, Trans. Sapp. Nat. Hist. Soc. 3:56, p1.2(4,11).*Epitrioza mizuhonica*: Aulmann, 1913, Psyll. Cat.: 60.*Epitrioza mizuhonica*: Sasaki, 1954, Sci. Rep. Mats. Agr. Coll. 14:36.*Epitrioza mizuhonica*: Miyatake, 1964b, Bull. Osaka Mus. Nat. Hist. 17:31-32.*Epitrioza mizuhonica*: Miyatake, 1965a, Icon. Ins. Jap. Col. nat. ed. 3:148, pl. 74(17)*Epitrioza mizuhonica*: Miyatake, 1969c, Bull. Osaka Mus. Nat. Hist. 22:81.*Epitrioza mizuhonica*: Baba et Miyatake, 1971, Ibid. 24:12-13.*Epitrioza mizuhonica*: Klimszewski, 1973, Ann. Zool. 30(7):240.*Epitrioza mizuhonica*: Miyatake, 1976, Lif. Tsushima Is.: 493.*Epitrioza mizuhonica*: Miyatake, 1977, Col. Ill. Ins. Jap. 2:164, p1.38(615).*Epitrioza mizuhonica*: Okuno et al., 1977, Dis. & Pests Cult. Trees & Shrubs Col.: 59.*Epitrioza mizuhonica*: Miyatake, 1978, Bull. Osaka Mus. Nat. Hist. 31:95-99, p1.10(1,4,7,10).*Epitrioza mizuhonica*: Miyatake, 1979, Ins. Niigata Pref. 50:222.*Epitrioza mizuhonica*: Park et al., 1979, Nat. & Life 9(2):107<sup>①</sup>.*Epitrioza mizuhonica*: Park et al., 1980b, Ibid. 10(1): 10<sup>②-③</sup>.*Epitrioza mizuhonica*: Kwon et Lee, 1981, Kor. Journ. Plant Prot. 20(3):156<sup>④-⑤</sup>.

Type-locality: Japan.

**Description:** General coloration light green to olive green in young specimens, greenish brown or reddish brown in older ones.

Vertex subquadrate, distinctly exceeding half as long as wide, with posterior margin somewhat straight. Genal cones short, about half as long as vertex, a little divergent, subacutely terminated apically, distinctly lower than vertex in plane. Antennae short, about 1.1 times as long as width of head including eyes, with the last segment black.

Forewings transparent, with apex located nearly in the middle of terminations of vein Rs and  $M_{1+2}$ ; cell m2 conspicuously elongate, longer than cul; surface spinules minute, more or less sparse, leaving very narrow spinule-free stripes along margins of veins.

Male proctiger with posterior margin roundly produced, with long pubescence. Parameres slender, with an acute apex curved anterad. Aedeagus with distal segment slightly arched near middle; apex a little swollen, somewhat crescent in lateral view.

Female proctiger with apex sharply acute, strongly upturned. Subgenital plate apparently shorter than proctiger.

**Length:** Body male 2.9-3.6mm, female 3.4-4.1mm; to tip of folded wings male 5.1-5.7mm, female 5.3-6.4mm.

**Locality:** GB : Daegu, Donghwasan Temple ③, Mt. Hwanghagsan, Mt. Palgongsan ④, Mt. Sobaegsan, Unmoonsa Temple (= Unmunsa Temple) ①, Yongyeonsa Temple ②.

GN : Mt. Gajisan, Samnam Myeon, Mt. Weonhyosan, Mt. Yeongchuisan ⑤.

JB : Mt. Naejangsan ⑥.

JJ : Mt. Hanlasan ③, Seoguipo ⑨.

JN : Is. Wando ⑦.

**Distribution:** Korea, Japan (Hokkaido, Honshu, Kyushu, Shikoku, Tsushima).

**Host-plant:** *Elaeagnus crispa* var. *parvifolia*, *E. glabra*, *E. macrophylla*.

## 62. *Epitrioza yasumatsui* Miyatake, 1978 (Borisu-namui)

*Epitrioza* sp.: Miyatake, 1969c, Bull. Osaka Mus. Nat. Hist. 22:81.

*Epitrioza* sp.: Miyatake, 1976, Lif. Tsushima Is.: 493.

*Epitrioza yasumatsui* Miyatake, 1978, Bull. Osaka Mus. Nat. Hist. 31:102-106, pl.10(3,6,9).

*Epitrioza yasumatsui*: Miyatake, 1979, Ins. Niigata Pref. 50:222.

*Epitrioza yasumatsui*: Kwon et Lee, 1981, Kor. Journ. Plant Prot. 20(3):156 ①-⑥

**Type-locality:** Japan.

**Description:** General coloration light green to olive green in young specimens, greenish brown to reddish brown in older ones.

Vertex subquadrate, distinctly exceeding half as long as wide, depressed a little posteriorly on each side of median suture. Genal cones short, about two-thirds as long as vertex, slightly divergent, with apices roundly or subacutely terminated. Antennae short, about 1.1 times as long as width of head including eyes, with the last segment black.

Forewings transparent, with apex located distinctly closer to termination of vein  $M_{1+2}$ ; cells m2 and cul somewhat parallelogramy; surfaces spinules minute, slightly obscure in middle portion, leaving very narrow spinule-free stripes along margins of veins.

Male proctiger with posterior margin roundly produced, with long pubescence. Parameres rather stout, sinuate basally, with apex directed caudad in lateral aspect.

Female proctiger with apex strikingly sharp and upturned, sinuate on dorsal side. Subgenital plate much shorter than proctiger.

**Length:** Body male 3.1-3.5mm, female 3.5-4.6mm; to tip of folded wings male 5.4-5.9mm, female 5.5-6.3mm.

**Locality:** CN : Mt. Deongsungsan, Mt. Gyeryongsan ①.  
 GB : Daegu, Mt. Naeyeonsan, Mt. Palgongsan.  
 GG : Is. Ganghwado, Seoul, Suweon.  
 GN : Mt. Gajisan ②, Is. Namhaedo ④, Mt. Weonhyosan ③.  
 JJ : Mt. Hanlasan ⑤, Manjanggul.  
 JN : Mt. Mudeungsan ⑥.

**Distribution:** Korea, Japan (Honshu, Kyushu, Shikoku, Tsushima).

**Host-plant:** *Elaeagnus multiflora*, *E. umbellata*.

Tribe TRICHOCHERMINI Kwon, trib. nov. (Teol-namui-jog)

Head generally small, rather elongate, less inclined forward and downward, somewhat flat. Vertex strikingly narrower between posterior angles than between anterior angles; median suture prominent and deep, with discal impressions conspicuous; anterior margin roundly produced at each side of frons and forming antennal ledges slightly overhanging antennal sockets. Genal cones well developed, more or less clavate, divided from vertex and genae by a slight constriction, below the vertex but on the same plane, directed forward. Frons rudimental, enveloped between bases of genal cones and anterior lobes of vertex, bearing median ocellus small but prominent. Eyes less convex, somewhat oval. Antennae usually exceeding width of head including eyes.

Thorax narrower than head including eyes; mesothorax wider than former. Forewings strikingly elongate, usually with acute apices. Hindtibia generally with genual spine at base, with 4 saltatorial spines at apex; basal metatarsus without saltatorial spines.

Containing single genus represented in Palaearctic, Oriental and Ethiopian Regions.

Genus 16. *Trichohermes* Kirkaldy, 1904 (Teol-namui-sog)

*Trichohermes* Kirkaldy, 1904, Ent. 37:280.

Type-species: *Trioza walkeri* Foerster, 1848

Type-locality: England.

*Trichopsylla* Thomson, 1891, Opusc. Ent. 8:823. nom. praec.

Type-species: *Trioza walkeri* Foerster, 1848

Type-locality: England.

Body generally covered with light hairs on dorsum, especially as in head and thorax. Head small, wider than prothorax, narrower than mesothorax, slightly inclined forward and downward. Vertex somewhat flat, narrower to posterior angles; anterior margin roundly produced at each side of frons, and slightly overhanging antennal sockets. Genal cones well developed, more or less clavate, somewhat constricted at base, more or less divergent, below the vertex but on the same plane, directed anterad. Frons rudimental, with median ocellus small but prominent. Eyes less convex.

Forewings markedly elongate, membranous or slightly thick, transparent or opaque, usually with color pattern; vein Rs usually long and strikingly sinuate. Hindtibia with genual spines often intricate at base, with 4 saltatorial spines at apex; basal metatarsus without saltatorial spines laterally.

Male proctiger usually with posterior margin broadly rounded, bearing with pubescence.

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Parameres somewhat subtriangular and subparallel-sided.

Female genitalia wedge-shaped, with apex more or less pointed.

Generally a small genus containing 5 species associated with plants of *Rhamnus*.

63. *Trichohermes grandis* Loginova, 1965 (Teol-namui)

*Trichohermes grandis* Loginova, 1965, Zool. Zh. 44(2):204-206.

*Trichohermes grandis*: Kuwayama et Miyatake, 1971, Mushi. 45(2):57.

*Trichohermes grandis*: Miyatake, 1971a, Bull. Osaka Mus. Nat. Hist. 24:4<sup>①</sup>.

*Trichohermes grandis*: Baba et Miyatake, 1971, Ibid. 24:11-12.

*Trichohermes grandis*: Klimaszewski, 1973, Ann. Zool. 30(7):249.

*Trichohermes grandis*: Loginova, 1974b, Ins. Mong. 2:57-58.

*Trichohermes grandis*: Miyatake, 1979, Ins. Niigata Pref. 50:222.

*Trichohermes grandis*: Park et al., 1980b, Nat. & Life. 10(1):10<sup>②-③</sup>.

*Trichohermes grandis*: Kwon et Lee, 1981, Kor. Journ. Plant Prot. 20(3):156-157<sup>④-⑤</sup>.

Type-locality: U.S.S.R. (Maritime Territory).

Description: General coloration yellowish brown to reddish brown; head and dorsum furnished with short hairs.

Vertex strikingly longer than half as long as wide, with discal impressions prominent located next to posterior margin. Genal cones prominently shorter than vertex, slightly constricted at base, divergent apically. Antennae about 1.3 to 1.4 times as long as width of head including eyes, with apical 2 segments dark brown.

Forewings elongate with apical margins acutely produced, usually opaque; with prominent irregular color patterns, for example-entirely brownish with numerous dark spots, brown anteriorly and posteriorly with transparent along middle like a white stripe, and brown markings on apical half and posterobasally-as indicated by Kuwayama et Miyatake (1971), or further irregular types.

Male proctiger roundly extended posteriorly, with pubescence. Parameres more or less broad, slightly bent at base, nearly subparallel-sided; apices bluntly terminated, with posterior end a little higher. Aedeagus with distal segment slender, bent at base; apex greatly inflated on upper side.

Female proctiger nearly as long as subgenital plate; length of anus about half as long as remainder of proctiger.

Length: Body male 2.4-2.7mm, female 2.8-3.7mm; to tip of folded wings male 4.74.9mm, female 4.8-5.2mm.

Locality: GB : Daegu, Mt. Hwanghagsan, Kachang (= Gachang vic. Daegu)<sup>②</sup>, Mt. Palgongsan, Mt. Sobaegsan, Mt. Sudosan<sup>①</sup>, Mt. Tohamsan, Yongyeonsa Temple<sup>③</sup>.

GG : Gwangleung, Suweon.

GN : Mt. Gajisan, Mt. Sinbulsan, Mt. Weonhyosan<sup>④</sup>.

JJ : Mt. Hanlasan<sup>⑤</sup>, Jungmun<sup>⑥</sup>.

Distribution: Korea, Japan (Honshu: Is. Sado), U.S.S.R. (Maritime Territory).

Host-plant: *Rhamnus daurica*.

Tribe TRIOZINI Loew, 1879 (Chang-namui-jog)

Body small to large sized. Head usually scarcely broader than thorax, often deflexed. Vertex much broader than long, usually deeply incised at anterior portion of median suture which some-

times prominently grooved, with discal impressions usually deep and prominent; posterior margin moderately to strongly emarginate or arcuate. Genal cones usually well developed, variable in length, shape and trend, depressed from plane of vertex, or rarely strikingly reduced or rudimental. Frons enveloped between bases of genal cones bearing with prominent median ocellus. Eyes strikingly convex, more or less spherical, extending well beyond lateral extremities of post-orbital ridges. Antennae slender, usually exceeding width of head including eyes.

Thorax generally well arched. Forewings elongate, with apical margin more or less angulate or narrowly rounded; membranous, usually transparent; without pterostigma and costal gap. Hindtibia usually with genual spine at base, with 3 or 4 saltatorial spines at apex; basal metatarsus without saltatorial spines laterally.

Male proctiger with or without subtriangular lobes posteriorly. Female genitalia varied, more or less wedge shaped.

Generally a large group, comprising of 6 genera in Palaearctica, still insufficiently investigated. Urgent revision is needed for split the accurate generic taxa, based on the world fauna.

#### Key to genera of Triozini

1. Hindtibia with 3 saltatorial spins arranged 1+2 at apex. Male proctiger with subtriangular lobes produced caudad, as long as wide or broader. Parameres slender in lateral view, tapered to apices . . . . . *Bactericera*  
 —. Hindtibia with 3 or 4 saltatorial spines arranged 1+2 or 1+3 at apex. Male proctiger without subtriangular lobes posteriorly, but simple or roundly enlarged, as long as wide or longer. Parameres varied . . . . . 2.
2. Hindtibia with 3 saltatorial spines arranged 1+2 at apex . . . . . *Heterotrioza*  
 —. Hindtibia with 4 saltatorial spines arranged 1+3 at apex . . . . . *Trioza*

#### Genus 17. *Bactericera* Puton, 1876 (Beod-namui-sog)

*Bactericera* Puton, 1876, Ann. Soc. Ent. Franc. 6(5):286.

Type-species: *Bactericera perrisi* Puton, 1876

Type-locality: France.

Head usually small, shorter than broad, scarcely exceeding width of mesothorax, deflexed anterad. Vertex generally wider than long, deeply incised at anterior portion of median suture, more or less bulging in front of each side of median suture; lateral ocellar region usually swollen; discal impressions present; posterior margin roundly concave. Genal cones usually well developed, variable in length, shape and trend, or often strikingly reduced or rudimental. Frons rudimental, deeply enveloped between bases of genal cones or antennal sockets, bearing median ocellus deep but prominent. Eyes strikingly convex, more or less spherical. Antennae slender, filiform, usually exceeding width of head including eyes; or often peculiar in shape, 3rd segment much thicker than other segments of flagellum.

Pronotum short, convexly rounded. Forewings usually elongate with apex more or less angulate or narrowly rounded, usually membranous and transparent; pterostigma and costal gap absent; radular spinules typical. Hindtibia with 3 saltatorial spines arranged 1+2 at apex; basal metatarsus without saltatorial spines laterally.

Male proctiger always with subtriangular lobes produced posteriorly. Parameres slender in lateral view, tapered to apex. Aedeagus with distal segment broadly swollen on half of upper side. Female genitalia usually short, wedge shaped.

Recently revised by Klimaszewski (1968) based on the material from Europe, dividing into 2 subgenera. Present knowledge indicates all the known members from Korea hitherto belonging to the subgenus *Smirnovia* Klimaszewski.

Subgenus *Smirnovia* Klimaszewski, 1968 (Dalmeunbeod-namui-asog)

*Smirnovia* Klimaszewski, 1968g, Ann. Univ. Mar. Cur.-Sklod. 22:13.

Type-species: *Trioza femoralis* Foerster, 1848

Type-locality: Germany.

Genal cones usually well developed, variable in length, shape and trend, more or less divergent apically, or very rarely reduced. Antennae moderately long, filiform, usually exceeding width of head including eyes; 3rd segment moderate, not strikingly thicker than other segments of flagellum. Hindtibia with 3 apical saltatorial spines, 1 on outer side and 2 on inner side; basal metatarsus without saltatorial spines laterally.

Male proctiger with subtriangular lobes posteriorly. Parameres narrow, often subparallel-sided, with apex tapered and curved anterad. Female genitalia usually short, somewhat wedge shaped.

Tentatively including 39 species from Palaearctica.

#### Key to species of *Smirnovia*

1. Forewing membrane with surface spinules present in all cells ..... 2.  
— Forewing membrane with surface spinules absent ..... 3.
2. Forewings with vein R+M+Cu1 brown to dark brown. Male parameres in lateral view approximately parallel-sided, with apex simply curved anteriorly ..... *B. (S.) distinctissima*  
— Forewings with veins usually yellowish brown at proximal portion. Male parameres somewhat tapered distad, with tips recurved anteriorly ..... *B. (S.) myohyangi*
3. Genal cones very small, atrophied and attached to antero-ventral sides of antennal sockets ..... *B. (S.) breviatiformis* sp. nov.  
— Genal cones usually well developed ..... 4.
4. General coloration dark brown to black, with pink reddish markings on intersegments. Female genitalia longer than broad, subgenital plate with a long spine-like process posteriorly ..... *B. (S.) calcarata*  
— General coloration light, with or without dark brown to black markings. Female genitalia shorter than broad, subgenital plate with somewhat dull apex ..... 5.
5. Head and thorax dirty yellowish to orange, without any prominent dark markings ..... 6.  
— Head and thorax with dark brown or black markings ..... 7.
6. Forewings broadest at middle ..... *B. (S.) miyatakei*  
— Forewings broadest at distal third ..... *B. (S.) koreana*
7. Genal cones entirely dark brown to black ..... *B. (S.) koreostriola* sp. nov.  
— Genal cones not entirely dark brown to black ..... 8.
8. Genal cones yellowish orange, with apices dark brown ..... *B. (S.) nobilis* sp. nov.  
— Genal cones milky white ..... *B. (S.) yamagishii*

64. *Bactericera* (S.) *distinctissima* Kwon et Lee, 1981 (Dalmeunbeod-namui)

*Trioxa salicivola* (sic et nec Reuter): Park et Lee, 1980b, Nat. & Life. 10(1):10<sup>①-④</sup>.

*Bactericera* (S.) *distinctissima* + *B. (S.) salicivora*: Kwon et Lee, 1981, Kor. Journ. Plant Prot. 20(3):157<sup>⑤-⑥</sup>.

Type-locality: Korea.

**Description:** General coloration light green in newly emerged form, or reddish to ochre brown with yellowish markings on venter in young specimens, developing dark brown or black markings in older ones.

Head dark brown to black. Vertex slightly longer than half as long as wide, deeply incised anteriorly. Genal cones somewhat stout, shorter than vertex, divergent apically. Antennae dark brown to black, with 3 basal segments milky white to pale yellowish, about 2 times as long as width of head including eyes.

Forewings long, narrow basally, widest in apical third, with surface spinules in all cells, leaving broad spinule-free stripes along margins of veins. Fore- and middlelegs tinted dark brownish.

Male proctiger with subtriangular lobes posteriorly; distal portion of lobes slightly bent upward in lateral view. Parameres long and narrow, apex curved anteriorly in lateral view. Aedeagus with distal segment more or less stout; apical half strikingly swollen on upper side.

Female proctiger very short, overhanging subgenital plate in lateral view; length of anus shorter than remainder of proctiger.

Previous records of *Bactericera salicivora* (Reuter, 1876) in Korea must refer to this species, though the former is known to be distributed widely throughout Palaearctic and Nearctic Regions. This species is very close to *B. salicivora*, but separated from it by the following characters as pointed out by Hodkinson (in his personal communication — 5 th, July, 1982 — to whom I had sent the specimens of *B. distinctissima* and asked for him comparing it with his rich material of *B. salicivora* from Northern Hemisphere):

- “1. *B. distinctissima* is darker coloured than any of my specimens of *salicivora*. While the abdomen of *salicivora* may be white in newly emerged specimens it is dark in fully coloured individuals.
2. The wing membrane and veins are more yellow in *salicivora*.
3. Vein Rs is more sinuous in *salicivora*.
4. The parameres are slightly broader in *salicivora*.
5. The proctiger of *salicivora* is not turned up at apical edge of posterior projection. Furthermore, the posterior projection is longer and more triangular in *salicivora*.”

The population hitherto known as *B. salicivora* feeding on narrow-leaved salices in Japan may be possibly the same species, *B. distinctissima*, as in case of Korea. Thus urgent check on the Far East Asiatic material is needed.

**Length:** Body male 2.1-2.2mm, female 2.2-2.4mm; to tip of folded wings male 3.7-3.9mm, female 3.9-4.2mm.

**Locality:** GB : Daegu<sup>⑥</sup>, Dansan Myeon, Gyeongju, Hayang Eub<sup>⑤</sup>, Jungdae (= Jeongdae vic. Daegu)<sup>③</sup>, Mt. Juwangsan, Mt. Naeyeonsan, Padong (= Daegu)<sup>①</sup>, Mt. Palgongsan, Mt. Sansungsan (= Mt. Sanseongsan vic. Daegu)<sup>④</sup>, Yeongcheon, Yongyeon-Temple<sup>②</sup>.

GG : Gwangleung, Mt. Soyosan.

GN : Busan, Mt. Gajisan, Mt. Gayasan, Mt. Jirisan, Samnam Myeon, Mt. Weonhyosan.

GW : Mt. Chiagsan, Mt. Odaesan, Mt. Seolagsan.

JN : Mt. Mudeungsan.

Y.J. KWON: Psylloidea of Korea

Distribution: Korea, Japan (?).

Host-plant: *Salix babylonica*, *S. spp.*

65. *Bactericera (S.) myohyangi* (Klimaszewski, 1968) (Myohyang-namui)

*Trioza myohyangi* Klimaszewski, 1968a, Bull. Acad. Pol. Sci. C1. 2. 16(5):290-291 ①.

*Trioza myohyangi*: Miyatake, 1971a, Bull. Osaka Mus. Nat.Hist. 24:1, 3 ②.

*Trioza myohyangi*: Kuwayama et Miyatake, 1971, Mushi. 45(2): 56 (N. Korea).

*Bactericera (S.) myohyangi*: Klimaszewski, 1973, Ann. Zool. 30(7):237(Korean Peninsula).

*Trioza myohyangi*: Park et al., 1980b, Nat. & Life. 10(1):9 ③.

*Bactericera (S.) myohyangi*: Kwon et Lee, 1981, Kor. Journ. Plant Prot. 20(3):157-158 ④.

Type-locality: Korea.

**Description:** General coloration yellowish orange to yellowish brown with dark brown markings; head dark brown to black; abdomen dark brown with venter somewhat tinted greenish; legs with dark brown markings.

Vertex about half as long as wide, deeply incised anteriorly, with prominent discal impressions next to posterior margin, elevated at lateral ocelli. Genal cones a little shorter than vertex, well produced, divergent and less subacutely terminated. Antennae usually 2 times as long as width of head including eyes, with 3 basal segments milky white to pale yellowish, remainder dark brown to black.

Forewings narrow, with surface spinules relatively sparse, leaving broad spinule-free stripes along margins of veins.

Male proctiger distinctly shorter than parameres, with subtriangular lobes posteriorly more or less narrow. Parameres very slender, somewhat tapered distad, with tips recurved anterad and less sharp in lateral view. Aedeagus with distal segment somewhat elongately swollen on upper side of apical portion.

Female proctiger very short, a little overhanging subgenital plate in lateral view; length of anus apparently shorter than remainder of proctiger.

**Length:** Body male 1.8-2.0mm, female 2.0-2.2mm; to tip of folded wings male 3.4-3.7mm, female 3.6-3.8mm.

**Locality:** GB : Daegu, Gyeongju, Jungdae (= Jeongdae vic. Daegu) ③, Mt. Juwangsan ④, Mt. Palgongsan, Mt. Sudosan ②.

GG : Mt. Soyosan, Suweon.

GN : Mt. Gajisan, Mt. Gayasan, Samnam Myeon.

GW : Mt. Odaesan, Mt. Seolagsan.

PB : Myohyang Geb ④.

**Distribution:** Korea, China (Shansi)

**Host-plant:** *Salix spp.*

66. *Bactericera (S.) brevitiformis* Kwon, sp. nov. (Eoriminbbul-namui)

**Description:** General coloration yellow brown, with dark brown markings; dorsum of thorax somewhat tinted with orange red streaks.

Head narrower than thorax. Vertex somewhat broad pentagonal, a little exceeding half as long as wide, with median suture very shallow, slightly elevated; anterior margin more or less straightly oblique at each half; discal impressions deep, located rather posteriorly; posterior margin



relatively straight. Genal cones very small, strikingly atrophied and attached to antero-ventral sides of antennal sockets. Median ocellus very small, deeply located between apical ledges of vertex and each inner base of antennal socket. Antennae slender, about twice as long as width of head including eyes; 3rd segment and distal half of 2nd segment pale yellow, remainder dark brown; the 3rd segment slightly less than twice as long as 4th segment, somewhat broader than next several segments but nearly half as wide as 2nd segment, not strikingly swollen or extending.

Forewings broadest at middle, with surface spinules entirely absent; marginal radular spinules prominent; costal margin evenly round.

Female genitalia short. Proctiger with apex less sharp and dark brown; length of anus very slightly shorter than remainder of proctiger. Subgenital plate less than proctiger.

**Length:** Body female 1.8mm; to tip of folded wings female 3.2mm.

**Type-examined:** Holotype female, Mt. Myeongjisan, GG, C. Korea, 16, V, 1982, coll. Y.J. Kwon.

**Remark:** The present new species is well separated from other superficially resembled species by the antennal structure, although the shape of genal cones of the new one has a resemblance to *Bactericera* sensu stricto.

**Host-plant:** Unknown.

#### 67. *Bactericera* (S.) *calcarata* (Schaefer, 1949) (*Ireunssug-namui*)

*Trioza calcarata* Schaefer, 1949, Mitt. Schweiz. Ent. Ges. 22(1):66-69.

*Trioza calcarata*: Loginova, 1962b, Trudy zool. Inst. Akad. Nauk. 31:43.

*Trioza calcarata*: Loginova, 1964a, Keys Ins. Eur. U.S.S.R. 1:479.

*Bactericera* (S.) *calcarata*: Klimaszewski, 1973, Ann. Zool. 30(7):234.

*Bactericera* (S.) *calcarata*: Kwon et Lee, 1981, Kor. Journ. Plant Prot. 20(3):158<sup>①</sup>.

**Type-locality:** Switzerland.

**Description:** General coloration dark brown to black, with pink reddish markings on intersegments.

Vertex slightly exceeding half as long as wide, deeply incised at apical portion of median suture, with discal impressions prominent, located next to posterior margin, elevated at lateral ocelli. Genal cones rather subacute at apices, well divergent distally, shorter than vertex. Antennae entirely dark brown to black, about 1.9 to 2 times as long as width of head including eyes.

Forewings elongate, widest in apical third; vein Rs slightly bisinuate, more or less exceeding end of M; surface spinules absent, only with marginal radular spinules.

Male proctiger with subtriangular lobes posteriorly, apparently shorter than parameres. Parameres long, more or less subparallel-sided in lateral aspect, with apices curved anterad; base greatly swollen on inner side in caudal view.

Female proctiger long, narrowed to apex; length of anus nearly half as long as remainder of proctiger. Subgenital plate entirely peculiar, with a long spine-like slender process apically.

In Kuwayama's original description (1910: 58, p1.2(f.4)) of *Trioza nigra* from Japan (Type-locality: Hokkaido, Honshu), the female of the present species was illustrated confusedly, so reinvestigation of the collecting localities on this type-material is needed, and the present species is naturally included in Japanese fauna (whether Hokkaido or Honshu?) for the first time here.

**Length:** Body male 1.9-2.1mm, female 2.1-2.2mm; to tip of folded wings male 3.4-3.6mm, female 3.6-3.8mm.

**Locality:** GB : Mt. Palgongsan<sup>①</sup>.

Y.J. KWON: Psylloidea of Korea

Distribution: Korea, Japan (Hokkaido or Honshu?), Switzerland, U.S.S.R. (European part, Skhalin).

Host-plant: *Artemisia* sp.

68. *Bactericera* (S.) *miyatakei* Kwon et Lee, 1981 (Gomabeod-namui)

*Bactericera* (S.) *miyatakei* Kwon et Lee, 1981, Kor. Journ. Plant Prot. 20(3):158<sup>①</sup>.

Type-locality: Korea.

Description: General coloration dirty yellowish to orange, with abdomen yellowish green.

Vertex tinted with orange, slightly longer than half as long as wide, incised anteriorly, with prominent discal impressions rather posteriorly. Genal cones distinctly shorter than vertex, divergent, inclined downwards. Antennae about 1.3 to 1.4 times as long as width of head including eyes, with 3 basal segments pale, remainder dark brown to black.

Forewings broadest at middle; surface spinules absent. only with marginal radular spinules in cells m1, m2, and cu1; cell m2 slightly larger than cu1; vein Rs a little bisinuate, more or less exceeding end of M; M<sub>3+4</sub> longer than Culb.

Male proctiger nearly as high as parameres or subgenital plate, with subtriangular lobes posteriorly. Parameres long, somewhat sickle-shaped in lateral aspect, with distal portion curved anteriorly. Aedeagus with distal segment greatly swollen on apical half of upper side.

Female proctiger short, in lateral view slightly overhanging subgenital plate; length of anus shorter than remainder of proctiger.

Length: Body male 1.4-1.5mm, female 1.5-1.6mm; to tip of folded wings male 2.4-2.5mm, female 2.6mm.

Locality: JB : Mt. Daedunsan<sup>①</sup>.

Distribution: Korea.

Host-plant: *Salix* sp.

69. *Bactericera* (S.) *koreana* (Klimaszewski, 1968) (Goreo-namui)

*Trioza koreana* Klimaszewski, 1968a, Bull. Acad. Pol. Sci. C1. 2. 16(5):291-292<sup>①-②</sup>.

*Trioza koreana*: Miyatake, 1971a, Bull. Osaka Mus. Nat. Hist. 24:1 (Korea).

*Bactericera* (S.) *koreana*: Klimaszewski, 1973, Ann. Zool. 30(7):236 (Korean Peninsula).

*Trioza koreana*: Park et al., 1980b, Nat. & Life. 10(1):9<sup>③</sup>.

*Bactericera* (S.) *koreana*: Kwon et Lee, 1981, Kor. Journ. Plant Prot. 20(3):158<sup>①-③</sup>.

Type-locality: Korea.

Description: General coloration reddish brown to orange red, without any dark markings.

Head width about 0.43mm. Vertex width about 0.28mm, length about 0.16mm, a little exceeding half as long as wide. Genal cones slightly shorter than vertex, broad basally, somewhat contiguous and pointed apically. Antennae about 0.65mm in length, nearly 1.5 times as long as width of head including eyes; 3rd segment a little shorter than twice as long as 4th segment; 3 basal segments yellowish brown, remainder dark brown to black.

Forewings colorless, with veins yellowish, broadest at distal third; about 2.15mm long and 0.85mm wide in male, 2.20mm long and 0.88mm wide in female; vein Rs exceeding end of M; surface spinules absent; cell m2 larger than cu1; ratio of cell cu1 about 1.5.

Male proctiger with broad subtriangular lobes posteriorly, nearly as high as subgenital plate.

Parameres about 0.15mm in length, with basal portion a little broader than distal half; apex narrowed and curved anterad.

**Length:** Body male 1.6-1.8mm, female 1.8-2.0mm; to tip of folded wings male 2.4-2.6mm, female 2.6-2.8mm.

**Locality:** GB : Jungdae (= Jeongdae vic. Daegu) ③.

GW : Mt. Seolagsan.

HB : Onpho bei Chongjin (= Onpo vic. Cheongjin) ②.

PB : Myohyang Geb ①.

**Distribution:** Korea.

**Host-plant:** *Salix* sp.

#### 70. *Bactericera* (S.) *koreostriola* Kwon, sp. nov. (Goribeod-namui)

**Description:** General coloration pale yellowish orange to yellowish brown, with brown to dark brown markings.

Vertex distinctly exceeding half as long as wide, deeply incised at anterior portion of median suture, with discal impressions deeply concave, located posteriorly. Genal cones apparently shorter than vertex, more or less divergent, pointed apically. Antennae about 1.6 times as long as width of head including eyes; 3rd segment dirty yellow or paler, remainder dark brown.

Forewings broadest at apical third, without surface spinules; veins yellowish brown; Rs bisinuate, exceeding half of  $M_{1+2}$ ; cell m2 larger than cu1.

Male proctiger about as high as subgenital plate, with somewhat broad subtriangular lobes posteriorly. Parameres nearly subparallel-sided in lateral view, with tips curved anteriorly. Aedeagus with distal segment a little long, with apical half elongately swollen on upperside, roundly terminated apically.

Female proctiger short, very slightly overhanging subgenital plate; length of anus about as long as remainder of proctiger. Subgenital plate distinctly shorter than proctiger.

**Length:** body male 1.5-1.7mm, female 1.6-2.0mm; to tip of folded wings male 2.8-3.0mm, female 2.9-3.1mm.

**Type-examined:** Holotype male, Mt. Gajisan, GN, S. Korea, 11, V, 1981, coll. Y.J. Kwon; paratypes: 2 females, 21, V, 1980, the same locality of holotype, on *Salix* sp., coll. Y.J. Kwon; Mt. Mayisan, JB, S. Korea, 1 male, 11, V, 1980, on *Salix koriyanagi*, coll. Y.J. Kwon; Is. Yogjido, GN, S. Korea, 2 males, 1 female, 20, I, 1981, coll. Y.J. Kwon; Mt. Obongsan, GW, C. Korea, 1 female, 17, V, 1981, on *Salix* sp., coll. Y.J. Kwon.

**Remark:** Although the present new species resembles *Bactericera striola* and *nigricornis* complex, it may be easily separated from them by the smaller body size and by the male genitalic structure. Formerly this species was recorded as a name of *Bactericera striola* (Flor, 1861) in Korea by Kwon et Lee (1981), and is rectified here as the new one.

**Host-plant:** *Salix koriyanagi*, *Salix* sp.

#### 71. *Bactericera* (S.) *nobilis* Kwon, sp. nov. (Yebbeuni-namui)

**Description:** General coloration yellowish orange to orange brown, with dark brown markings; dorsum of thorax with dark brown longitudinal stripes.

Head narrower than thorax. Vertex yellowish orange, slightly exceeding half as long as wide, incised at apical portion of median suture which is deep and dark brown, elevated at lateral ocelli;

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discal impressions greatly concave. Genal cones simple conical, strikingly divergent, slightly shorter than vertex and about same length as half as width of vertex, coloring yellowish orange with apices dark brown. Antennae slender, about 1.9 times as long as width of head including eyes; basal 2 segments and proximal half of 3rd segment milky white to pale yellow, other segments dark brown to black distally.

Forewings elongate, somewhat broadest at distal three-fifths, with surface spinules only partly present on clavus; marginal radular spinules prominent; cell m2 a little larger than cu1. Legs dirty yellowish to yellow orange; femora yellow orange with dark brown longitudinal irregular streaks.

Female genitalia short. Proctiger slightly overhanging subgenital plate, with apex dark brown; length of anus somewhat shorter than remainder of proctiger.

**Length:** Body female 1.85mm; to tip of folded wings female 3.4mm.

**Type-examined:** Holotype female, Mt. Palgongsan, GB, S. Korea, 29, IV, 1982, coll. Y.J. Kwon.

**Remark:** This new species is apparently distinguished from other resembled smirnovian complex by the characteristic external feature.

**Host-plant:** Unknown.

72. *Bactericera* (*S.*) *yamagishii* Kwon et Lee, 1981 (Sanbeod-namui)

*Bactericera* (*S.*) *yamagishii* Kwon et Lee, 1981, Kor. Journ. Plant Prot. 20(3):158<sup>Ⓚ</sup>.

**Type-locality:** Korea.

**Description:** General coloration orange yellowish to ochre brown, with dark brown markings.

Vertex with dark brown to black markings on disc, distinctly longer than half as long as wide, incised anteriorly, with prominent discal impressions located rather posteriorly. Genal cones milky white, shorter than vertex, divergent and pointed apically. Antennae about 1.5 times as long as width of head including eyes, with 3 basal segments yellowish brown or paler, remainder dark brown to black.

Forewings long, narrow basally, widest in apical third, without surface spinules; veins yellow to yellowish brown; Rs bisinuate and reaching half of  $M_{1+2}$ ; cell m2 about as large as cu1.

Male proctiger a little shorter than subgenital plate or parameres, with narrow subtriangular lobes on distal half of posterior margin, furnished with long macrosetae on apical portion of the lobes. Parameres narrow and long, rather straight in lateral view, with apices pointed. Aedeagus with distal segment relatively short, with apical half more or less inflated on dorsal side; apex of proximal segment enlarged.

Female proctiger short, slightly sinuate next to apex in lateral aspect; length of anus shorter than remainder of proctiger.

**Length:** Body male 1.7-1.9mm, female 1.9-2.0mm; to tip of folded wings male 3.2-3.3mm, female 3.5-3.6mm.

**Locality:** GN : Mt. Gajisan<sup>Ⓚ</sup>.

**Distribution:** Korea.

**Host-plant:** *Salix* sp.

Genus 18. *Heterotrioza* Dobreanu et Manolache, 1962 (Myeongaju-Namui-sog)

*Heterotrioza* Dobreanu et Manolache, 1962, Faun. Rep. pop. Rom. Ins. 8(3):344.

Type-species: *Trioza obliqua* Thomson, 1877

Type-locality: Sweden.

Head generally small, distinctly shorter than broad, scarcely exceeding width of mesothorax. Vertex shorter than narrow, deeply incised at anterior portion of median suture, deflexed, often bulging in front of each side of median suture, somewhat rounded antero-laterally; discal impressions present; lateral ocellar region often markedly swollen; posterior margin usually concave. Genal cones usually conical, well developed, varied in length, shape and trend, depressed from plane of vertex. Frons rudimental, bearing median ocellus deeply located between bases of genal cones.

Forewings elongate, membraneous and transparent, usually angulately rounded at apex; vein Rs often short, not reaching the termination of  $M_{3+4}$ ; pterostigma and costal gap absent; radular spinules present typically; surface spinules present or rarely absent. Hindtibia with a genual spine often together with a series of microspines at base, with 3 saltatorial spines arranged 1+2 at apex; basal metatarsus without saltatorial spines laterally.

Male proctiger simply broadly rounded posteriorly or tubular. Parameres rather broad and variable in shape. Aedeagus with or without subapical processes on distal segment. Female genitalia more or less short, not markedly long, wedge shaped.

Comprising of 2 subgenera as revised by Klimaszewski (1968g).

#### Key to subgenera of *Heterotrioza*

1. Head and thorax in male dark brown to black, abdomen yellowish green; female usually yellowish green. Male aedeagus with a pair of subapical processes, bent downwards on dorsal side of apex . . . . . *Heterotrioza*  
 —. General coloring yellowish orange to yellowish brown, with or without dark markings.  
 Male aedeagus without subapical processes on dorsal side . . . . . *Dyspersa*

Subgenus *Heterotrioza* Dobreanu et Manolache, 1962 (Myeongaju-namui-asog)

*Heterotrioza* Dobreanu et Manolache, 1962, Faun. Rep. pop. Rom. Ins. 8(3):344.

Type-species: *Trioza obliqua* Thomson, 1877

Type-locality: Sweden.

Genal cones rather long, divergent apically. Forewings transparent and membraneous, with apex more or less angulate; vein Rs not reaching the termination of  $M_{3+4}$ ; surface spinules present, completely covering or greatly reduced to base. Hindtibia with 3 saltatorial spines bearing 1 on outer side and 2 on inner side; basal metatarsus without saltatorial spines.

Male proctiger somewhat broadly rounded posteriorly, without prominent subtriangular lobes. Parameres more or less broad, with apex less sharp or scarcely curved anterad. Aedeagus with discal segment bearing a pair of prominent and peculiar subapical processes which bent downwards on lower side of apex. Female genitalia less long, wedge shaped.

Hitherto 6 species have placed into the subgenus in Palaearctica. The following one is occur in Korea.

#### 73. *Heterotrioza* (s. str.) *obliqua* (Thomson, 1877) (Myeongaju-namui)

*Trioza obliqua* Thomson, 1877, Opusc. Ent. 8:825.

*Trioza obliqua*: Reuter, 1881, Ent. Tidskr. 2:166.

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- Trioza obliqua*: Oshanin, 1907, Ann. Mus. Zool. St. Pet. 12:373.  
*Trioza obliqua*: Aulmann, 1913, Psyll. Cat.: 50.  
*Trioza (Heterotrioza) obliqua*: Dobreanu et Manolache, 1962, Faun. Rep. pop. Rom. Ins. 8(3):344-348.  
*Trioza obliqua*: Loginova, 1964a, Keys Ins. Eur. U.S.S.R. 1:477.  
*Trioza obliqua*: Loginova, 1966b, Trudy Mold. nauch.-issl. Inst. 13:146.  
*Trioza obliqua*: Loginova, 1968, Trudy Vses. Ent. Obshch. 52:310-312.  
*Trioza obliqua obliqua*: Klimaszewski, 1968a, Bull. Acad. Pol. Sci. Cl. 2. 16(5): 289-290<sup>①-②</sup>.  
*Heterotrioza (Heterotrioza) obliqua*: Klimaszewski, 1968g, Ann. Univ. Mar. Cur-Sklod. 22:11.  
*Trioza obliqua obliqua*: Miyatake, 1971a, Bull. Osaka Mus. Nat. Hist. 24:1 (Korea).  
*Heterotrioza (Heterotrioza) obliqua*: Klimaszewski, 1973, Ann. Zool 30(7): 242(Korean Peninsula).  
*Trioza obliqua*: Mathur, 1975, Psyll. Ind. Subc.: 390-394.  
*Heterotrioza obliqua obliqua*: Klimaszewski, 1975, Faun. Polsk. 3:265-267.  
*Heterotrioza (s. str.) obliqua*: Kwon et Lee, 1981, Kor. Journ. Plant Prot. 20(3):159<sup>③-⑦</sup>.  
*Heterotrioza obliqua*: Lee et Kwon, 1981, Rep. Kor. Ass. Cons. Nat. 19:152<sup>⑧-⑨</sup>.

Type-locality: Sweden.

**Description:** General coloration yellowish green, head and dorsum of thorax dark brown to black; overwintering forms developing other brown to dark brown markings.

Vertex distinctly exceeding half as long as wide, deeply incised apically, with discal impressions greatly concave. Genal cones rather slender, shorter than vertex, slightly divergent, entirely dark brown to black in male. Antennae about 1.7 to 1.8 times as long as width of head including eyes, with distal half dark brown.

Forewings elongate, pointed apically, widest near middle, with surface spinules wanting, only slightly present at base; vein Rs gently upturned, leaching end of M.

Male proctiger extending roundly at posterior margin, with short tubular apex. Parameres shorter than proctiger, broad, widest at middle, with apices abruptly narrowed in lateral aspect. Aedeagus with distal segment bearing a pair of arm-like subapical processes, which bent downwards on lower side of apex; apex of proximal segment greatly extending.

Female genitalia nearly as long as wide. Proctiger strikingly narrowed to apical half, with a slender transverse stripe near middle; length of anus far less than remainder of proctiger. Subgenital plate about as long as proctiger.

Korean population is belonging to the original subspecies as revealed by Klimaszewski (1968).

**Length:** Body male 1.4-1.5mm, female 1.5-1.7mm; to tip of folded wings male 2.4-2.7mm, female 2.7-2.9mm.

**Locality:** GB : Mt. Bohyeonsan, Daegu<sup>④</sup>, Dansan Myeon, Dasan Myeon, Is. Dogdo<sup>⑤</sup>, Gyeongju, Hayang Eup (= Hayang Eub)<sup>③</sup>, Mt. Juwangsang, Mt. Naeyeonsan, Mt. Palgongsan, Is. Ulreung (= Is. Ulleungdo; Naridong)<sup>⑥</sup>.

GG : Is. Ganghwado, Gwangleung, Mt. Myeongjisan, Seoul, Mt. Soyosan, Suweon.

GN : Bangeojin, Busan, Mt. Gajisan, Mt. Gayasan, Is. Geoje-do, Is. Hansando, Mt. Jirisan, Masan, Samnam Myeon<sup>⑤</sup>, Mt. Weonhyosan, Is. Yokjido (= Is. Yogjido)<sup>⑥</sup>.

GW : Mt. Chiagsan, Chuncheon, Mt. Obongsan, Mt. Odaesan, Mt. Seolagsan.

JJ : Is. Chujado, Jungmun, Seoguipo, Seongsanpo.

JN : Is. Daeheugsando, Is. Hongdo<sup>⑦</sup>, Mt. Mudeungsan.

**Distribution:** Korea, U.S.S.R. (S. European part), Poland, Rumania, Sweden.

**Host-plant:** *Chenopodium* spp., *Atriplex* spp.

Subgenus *Dyspersa* Klimaszewski, 1968 (Nog-namui-asog)

*Dyspersa* Klimaszewski, 1968g, Ann. Univ. Mar. Cur.-Sklod. 22:11.

Type-species: *Trioza apicalis* Foerster, 1848

Type-locality: Germany.

Genal cones short or long, divergent or slightly contiguous apically. Forewings membraneous and mostly transparent, angulately or rarely narrowly rounded at apex; surface spinules present or often absent; vein Rs often short, not reaching the end of  $M_{3+4}$ . Hindtibia with 3 saltatorial spines bearing 1 on outer side and 2 on inner side; basal metatarsus without saltatorial spines laterally.

Male proctiger simple tubular, or roundly extending posteriorly. Parameres rather broad. Aedeagus without subapical processes on apex of distal segment, simply swollen. Female genitalia less long, more or less wedge shaped.

In Palaearctica 27 species have been known to belonging to this subgenus.

#### Key to species of *Dyspersa*

1. Forewings with vein Rs exceeding the termination of vein  $M_{3+4}$ . Big species longer than 3mm in total length . . . . . *H. (D.) ukogi*  
 —. Forewings with vein Rs shorter than the termination of vein  $M_{3+4}$ . Small species less than 3mm in total length . . . . . 2.
2. Genal cones distinctly exceeding half of median length of vertex. Living on *Pueraria* sp . . . . . *H. (D.) chilgia*  
 —. Genal cones nearly half as long as vertex. Living on *Synnamomum* sp. . . *H. (D.) noknamui*

#### 74. *Heterotrioza (D.) ukogi* (Shinji, 1940) (Ogalpi-namui)

*Trioza ukogi* Shinji, 1940, Ins. World. 44:66-67.

*Trioza ukogi*: Shinji, 1944, Gall & Gall-Ins.: 451-453.

*Trioza ukogi*: Sasaki, 1954, Sci. Rep. Mats. Agr. Coll. 14:38.

*Trioza ukogi*: Kim, 1965, Res. Bull. Chinju Agr. Coll. 4:53 ①

*Trioza ukogi*: Kim, 1967, Journ. Inst. Agr. Res. Util. Chinju Agr. Coll. 1:90 ①.

*Trioza ukogi*: Ko, 1969, List For. Ins. Pests Kor.: 25 (Korea).

*Trioza ukogi*: Miyatake, 1971a, Bull. Osaka Mus. Nat. Hist. 24:1 (Korea).

*Trioza ukogi*: Kor. Soc. Pl. Prot., 1972, List Pl. Dis., Ins. Pests, & Weeds Kor.: 122 (Korea).

*Heterotrioza (Dyspersa) ukogi*: Klimaszewski, 1973, Ann. Zool. 30(7):248.

*Heterotrioza (D.) ukogi*: Kwon et Lee, 1981, Kor. Journ. Plant Prot. 20(3):159 ①.

**Type-locality:** Japan.

**Description:** General coloration yellowish brown, with dark brown longitudinal markings on dorsum of abdomen; a rather larger species.

Head usually concolorous with body, without dark markings. Eyes dirty pale brown. Genal cones prominent, but somewhat dull apically. Antennae shorter than length of head and thorax

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put together, with proximal half yellowish and remainder dark brown to black; 3rd segment longest, about as long as 4th to 6th segments put together; apical 2 segments about as long as basal 2 ones, a little swollen; 5th segment nearly half as long as 4th segment.

Forewings transparent, about 4 times as long as wide, pointed apically, with veins yellowish brown; vein R+M+Cul about half as long as M;  $M_{1+2}$  longer than  $M_{3+4}$ ; M about twice as long as  $M_{3+4}$ ; R about twice as long as R1; Rs somewhat wavy and not reaching apex of wing, with length of 6 times as long as R; Cul about triple as long as Culb, Cula about twice as long as Culb and strikingly arched.

Male proctiger longer than subgenital plate.

**Length:** Body female 3.5mm; to tip of folded wings 4.7-4.9mm.

**Locality:** GN : Mt. Jiri (= Mt. Jirisan)<sup>①</sup>.

**Distribution:** Korea, Japan (Honshu).

**Host-plant:** *Acantopanax chiisanensis*.

75. *Heterotrioza (D.) chilgia* (Park et Lee, 1980) (*Chilg-namui*)

*Trioza camphorae* (nec Sasaki): Kim, 1965, Res. Bull. Chinju Agr. Coll. 4:53<sup>①</sup>.

*Trioza camphorae* (nec Sasaki): Kim, 1967, Journ. Inst. Agr. Res. Util. Chinju Agr. Coll. 1:90<sup>①</sup>.

*Trioza camphorae* (nec Sasaki): Ko, 1969, List For. Ins. Pests Kor.: 24 (Korea).

*Trioza camphorae* (nec Sasaki): Miyatake, 1971a, Bull. Osaka Mus. Nat. Hist. 24:1 (Korea).

*Trioza camphorae* (nec Sasaki): Kor. Soc. Pl. Prot., 1972, List Pl. Dis. Ins. Pests, & Weeds Kor.: 122.

*Trioza chilgia* Park et Lee, 1980a, Nat. & Life. 10(2):15-17<sup>②-④</sup>.

*Heterotrioza (D.) chilgia*: Kwon et Lee, 1981, Kor. Journ. Plant Prot. 20(3):159<sup>⑤-⑫</sup>.

**Type-locality:** Korea.

**Description:** General coloration yellowish orange to bright orange, with reddish brown to dark brown longitudinal markings on dorsum and sides of thorax, usually overwintering forms developing dark brown markings on body.

Vertex a little exceeding half as long as wide at median line, with posterior margin deep angularly concave; discal impressions prominent located rather posteriorly. Genal cones apparently shorter than vertex, somewhat stout basally, divergent apically. Antennae about as long as width of head including eyes, with 2 basal and 3 apical segments usually dark brown.

Forewings narrow and elongate, apically pointed, without surface spinules; vein Rs strikingly short, reaching end of Cula; cell m2 smaller than cul.

Male proctiger relatively broad tubular, distinctly exceeding parameres. Parameres somewhat broad, widest near base, rather obliquely tapered to apex, sharply pointed and directed anterad in lateral aspect. Aedeagus with distal segment rather long, apex very slightly swollen.

Female genitalia longer than wide. Proctiger with apex more or less sharply terminated; length of anus nearly half as long as remainder of proctiger. Subgenital plate a little exceeding proctiger.

**Length:** Body male 1.3-1.5mm, female 1.5-1.8mm; to tip of folded wings male 2.4-2.7mm, female 2.7-3.1mm.

**Locality:** GB : Daegu, Dansan Myeon, Hwangak Mt. (= Mt. Hwanghagsan)<sup>②</sup>, Mt. Palgongsan<sup>③</sup>, Yongyeon Temple (= Yongyeonsa Temple)<sup>③</sup>.

GN : Mt. Jiri (= Mt. Jirisan)<sup>①, ⑥</sup>, Tongdo Temple (= Tongdosa Temple)<sup>④</sup>.



JJ : Mt. Hanlasan ⑧, Jungmun ⑩, Seoguipo ⑨.

JN : Is. Heuksando (= Is. Daeheugsando) ⑫, Is. Hongdo ⑪, Mt. Mudeungsan ⑦.

Distribution: Korea.

Host-Plant: *Pueraria lobata*.

76. *Heterotrioza (D.) noknamui* Kwon et Lee, 1981 (Jejunog-namui)

*Heterotrioza (D.) noknamui* Kwon et Lee, 1981, Kor. Journ. Plant Prot. 20(3):159 ①.

Type-locality: Korea.

Description: General coloration dirty yellowish to orange, dark brown longitudinal markings on each side at dorsum behind eyes; abdomen with dark brown to black markings on dorsal side.

Vertex distinctly exceeding half as long as wide, incised anteriorly, with prominent discal impressions posteriorly. Genal cones short, nearly half as long as vertex; distal half somewhat paler. Antennae pale yellowish with 2 basal and 2 apical segments dark brown.

Forewings elongate and narrow, broadest distal third to middle, without surface spinules; vein Rs strikingly short, usually not exceeding end of Cula; cell m2 usually slightly smaller than cul.

Male proctiger somewhat stout and tubular, longer than parameres. Parameres somewhat broad, widest near base, obliquely tapered to apex, sharply pointed and directed anterad in lateral aspect. Aedeagus with distal segment apparently longer than parameres, a little narrow and slightly curved at middle, with apex more or less roundly swollen. Subgenital plate greatly broad.

Female proctiger with apex sharply narrowed in lateral aspect; length of anus a little shorter than remainder of proctiger. Subgenital plate strikingly exceeding proctiger.

Length: Body male 1.2-1.4mm, female 1.5-1.6mm; to tip of folded wings male 2.2-2.4mm, female 2.5-2.8mm.

Locality: JJ : Is. Chujado, Jungmun.

Distribution: Korea.

Host-plant: *Cinnamomum camphora*.

Genus 19. *Trioza* Foerster, 1848 (Chang-namui-sog)

*Trioza* Foerster, 1848, Verh. nat. Ver. preuss. Rheinl. 3:67.

Type-species: *Chermes urticae* Linnaeus, 1758

Type-locality: Sweden.

Head usually small, shorter than broad, scarcely exceeding width of mesothorax, deflexed. Vertex wider than long, usually deeply incised at anterior portion of median suture which prominently grooved, more or less bulging anteriorly on each side of median suture; discal impressions present; lateral ocellar region usually elevated; posterior margin moderately to strongly emarginate or arcuate. Genal cones usually well developed, varied in length, shape and trend, or rarely strikingly reduced or rudimental. Frons rudimental, deeply enveloping between bases of genal cones or antennal sockets, bearing median ocellus deep and prominent. Eyes strikingly convex, more or less spherical.

Forewings membranous, transparent, with apex more or less angulate or roundly terminate;

surface spinules present or absent. Hindtibia with 4 saltatorial spines bearing 1 on outer side and 3 on inner side; basal metatarsus without saltatorial spines laterally.

Male proctiger simple tubular or broadly rounded posteriorly. Parameres variable in shape. Female genitalia often long, or varied in length, somewhat wedge shaped.

Generally a large and diverse group but loosely defined genus, representing in world distribution. Most of the members are still insufficiently investigated and in urgent need of revision, thus they are provisionally treated here in wide sense.

#### Key to species of *Trioza*

1. Body dirty yellow to orange, or yellowish brown, without black markings on head and venter. Usually smaller species not exceeding 3mm in total length . . . . . 2.  
 —. Body with prominent dark brown to black markings, or generally coloring dark brown to blackish. Bigger species exceeding 3mm in total length . . . . . 3.
2. Forewings with cell *cul* twice as large as cell *m*<sub>2</sub>. Living on *Celtis sinensis* var. *japonica* . . . . . *T. brevifrons*  
 —. Forewings with cell *cul* nearly as large as cell *m*<sub>2</sub>. Living on *Chrysanthemum* spp. . . . . *T. abdominalis*
3. Genal cones very small, reduced and attached to antero-ventral sides of antennal sockets. Antennal sockets very large, bulging near anterior margin of vertex . . . . . *T. breviata*  
 —. Genal cones more or less conical, usually well developed. Antennal sockets smaller than genal cones . . . . . 4.
4. Vertex and dorsum with long hairs sparsely scattered. Genal cones black, nearly as long as vertex . . . . . *T. nigra*  
 —. Vertex and dorsum with few very short hairs. Genal cones light, nearly half as long as vertex . . . . . *T. mayicola*

#### 77. *Trioza brevifrons* Kuwayama, 1910 (Bbyojogpaeng-namui)

*Trioza brevifrons* Kuwayama, 1910, Trans. Sapp. Nat. Hist. Soc. 3:61.

*Trioza brevifrons*: Aulmann, 1913, Psyll. Cat.:40.

*Trioza brevifrons*: Crawford, 1919, Phil. Journ. Sci. 15:188.

*Trioza brevifrons*: Kuwayama, 1922, Ins. World. 26:372.

*Trioza brevifrons*: Kuwayama, 1931, Ins. Mats. 5(3):128-129.

*Trioza brevifrons*: Miyatake, 1964b, Bull. Osaka Mus. Nat. Hist. 17:31.

*Trioza* sp. 1: Miyatake, 1969c, Ibid. 22:80-81.

*Trioza* sp.: Miyatake, 1971a, Ibid. 24:3<sup>Ⓚ</sup>.

*Trioza brevifrons*: Klimaszewski, 1973, Ann. Zool. 30(7):251.

*Trioza* sp.: Miyatake, 1976, Lif. Tsushima Is.:494.

*Trioza brevifrons*: Miyatake, 1979, Ins. Niigata Pref. 50:221.

*Trioza brevifrons*: Kwon et Lee, 1981, Kor. Journ. Plant Prot. 20(3):160<sup>Ⓚ</sup>.

Type-locality: Taiwan.

**Description:** General coloration yellowish brown to orange brown, with light longitudinal stripes on dorsum of thorax.

Vertex about half as long as wide, with posterior margin slightly concave. Genal cones short, about half as long as vertex, yellowish, somewhat darkly tinted at apices, slightly contiguous on

inner sides. Antennae about one-third as long as length of Costa, pale yellowish, with apical 2 segments black.

Forewings less than triple as long as wide, transparent, somewhat invisibly brownish tinted; veins yellowish, Rs rather straight, R about twice as long as R<sub>1</sub>; cell cul about twice as large as m<sub>2</sub>. Legs yellowish, apices of 2nd tarsi and claws tinted brownish. Abdomen brown, with genitalia yellowish.

Female subgenital plate a little longer than preceding abdominal segment, with apex sharply terminated. Proctiger as the same shape of subgenital plate.

Although Miyatake (1979) put the material of Japan proper and Korea feeding on *Celtis sinensis* var. *japonica* into the above species of which the type-locality is Formosa (= Taiwan) as a conspecific element, he suggested that the Japanese material including Korean one might be a different species, possibly being a new-one.

**Length:** Body male 1.6-1.8mm, female 1.9-2.1mm; to tip of folded wings male 3.2-3.4mm, female 3.4-3.6mm.

**Locality:** GB : Mt. Sudosan ①.

**Distribution:** Korea, Japan (Honshu, Tsushima, Kyushu, Shikoku), Taiwan.

**Host-plant:** *Celtis sinensis* var. *japonica*.

#### 78. *Trioza abdominalis* Flor, 1861 (Galgori-namui)

*Trioza abdominalis* Flor, 1861a, Rhynch. Livl. 2:502.

*Trioza abdominalis*: Flor, 1861b, Bull. S. N. Mosc.:381, 392.

*Trioza abdominalis*: Reuter, 1881, Ent. Tidskr. 2:62, 165.

*Trioza abdominalis*: Dalla Torre, 1892, Berl. Nat. med. Ver. Innsbr. 20:104.

*Trioza abdominalis*: Edwards, 1896, Hem. Hom. Brit. Isl.:260.

*Trioza abdominalis*: Sulč, 1912, Sitz. ber. boehm. Ges. Wiss. math.-nat. 16:8-13, pl. 23.

*Trioza abdominalis*: Aulmann, 1913, Psyll. Cat.:37.

*Trioza abdominalis*: Schaefer, 1949, Mitt. Schweiz. Ent. Ges. 22(1):58.

*Trioza abdominalis*: Loginova, 1964a, Keys Ins. Eur. U.S.S.R. 1:479.

*Trioza abdominalis orientalis* Klimaszewski, 1966b, Ann. Zool. 23(14):426-428.

*Trioza abdominalis*: Klimaszewski, 1968g, Ann. Univ. Mar. Cur.-Skłod. 22:9.

*Trioza abdominalis orientalis*: Klimaszewski, 1973, Ann. Zool. 30(7):250.

*Trioza abdominalis abdominalis*: Klimaszewski, 1975, Faun. Polsk. 3:213-215.

*Trioza abdominalis*: Hodkinson et White, 1979, Handb. Ident. Brit. Ins. 2(5a):71-72.

*Trioza abdominalis*: Kwon et Lee, 1981, Kor. Journ. Plant Prot. 20(3):160 ①-③.

*Trioza abdominalis*: White et Hodkinson, 1982, Handb. Ident. Brit. Ins. 2(5b):43.

**Type-locality:** U.S.S.R. (Latvia).

**Description:** General coloration dirty yellow to orange, or yellowish brown, with sometimes brown markings; abdomen light green.

Vertex distinctly exceeding half as long as wide, with posterior margin more or less straight; discal impressions deeply concave at next to middle. Genal cones short conical, a little exceeding half as long as vertex, divergent apically. Antennae about 1.2 to 1.3 times as long as width of head including eyes, with 3rd segment paler, remainder dark brown.

Forewings elongate, with apices deeply rounded; surface spinules prominent, distributed in all cells, only leaving very narrow spinule-free stripes along margins of veins; veins yellowish, Rs very slightly wavy and reaching half of M<sub>1+2</sub>.

Male proctiger somewhat broadly and roundly extended posteriorly. Parameres rather broad,

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with apex very peculiar in shape, forming anteriorly directed beak-like process; subapical process truncate. Aedeagus with distal segment relatively large, curved near neck; apex with small papillar process directed downward.

Female genitalia longer than wide. Proctiger more or less wavy on dorsal side; Length of anus nearly half as long as remainder of proctiger. Subgenital plate about as long as proctiger.

Korean population is referable to subsp. *orientalis* Klimaszewski, 1966.

**Length:** Body male 1.7-1.8mm, female 1.9-2.0mm; to tip of folded wings male 2.7-2.9mm, female 3.0-3.1mm.

**Locality:** GB : Daegu, Dansan Myeon, Mt. Juwangsan, Mt. Naeyeonsan.

GN : Mt. Jirisan<sup>②</sup>, Samnam Myeon.

JB : Mt. Deogyusan<sup>①</sup>.

JJ : Mt. Hanlasan<sup>③</sup>.

**Distribution:** Korea, Mongolia, U.S.S.R. (N.W. European part), Europe.

**Host-plant:** *Chrysanthemum* sp.

79. *Trioza breviata* Kwon et Lee, 1981 (Minbbul-namui)

*Trioza breviata* Kwon et Lee, 1981, Kor. Journ. Plant Prot. 20(3):160<sup>①</sup>.

**Type-locality:** Korea.

**Description:** General coloration dirty yellow, with dark brown markings on head, dorsum, and abdomen.

Vertex dark brown, with posterior half much darker, nearly half as long as wide, broadly depressed mesally, prominently elevated at lateral ocelli. Eyes reddish brown. Median ocellus prominent, yellowish orange, 0.11mm in diameter. Antennal sockets very large, much bigger than genal cones. Genal cones very small, greatly reduced and attached to antero-ventral sides of antennal sockets, divergent.

Pronotum dirty yellow, slightly narrower than head including eyes. Mesonotum polished dark brown. Legs dirty pale yellowish; fore and middle femora with brown markings; apices of tarsi brownish; claws dark brown to black. Hindtibia with 4 saltatorial spines arranged 1+3 at apex.

Female genitalia distinctly longer than broad, dark brown, with middle portion light brown, evenly tapered to apex. Proctiger slightly larger than subgenital plate, with dorsal side rather straight in lateral aspect; length of anus less than half as long as remainder of proctiger. Subgenital plate with apex rather sharp.

**Length:** Body female 2.29mm.

**Locality:** GN : Mt. Jirisan<sup>①</sup>.

**Host-plant:** Unknown.

80. *Trioza nigra* Kuwayama, 1910 (Ddaejug-namui)

*Trioza nigra* Kuwayama, 1910, Trans. Sapp. Nat. Hist. Soc. 3:57-58, p1. 2(13).

*Trioza nigra*: Aulmann, 1913, Psyll. Cat.:50.

*Trioza nigra*: Shinji, 1938a, Kontyu. 12(4):146.

*Trioza nigra*: Shinji, 1944, Galls & Gall-Ins.:451.

*Trioza nigra*: Kuwayama, 1950, Icon. Ins. Jap. ed. sec.:329.

- Trioza nigra*: Sasaki, 1954, Sci. Rep. Mats. Agr. Coll. 14:38.  
*Trioza nigra*: Miyatake, 1965a, Icon. Ins. Jap. Col. nat. ed. 3:148, pl. 74(21).  
*Trioza nigra*: Miyatake, 1965b, Kontyu 33(1):182.  
*Trioza nigra*: Miyatake, 1966, Ibid. 34(4):330.  
*Trioza nigra*: Miyatake, 1969c, Bull. Osaka Mus. Nat. Hist. 22:79-80.  
*Trioza nigra*: Ko, 1969, List For. Ins. Pests Kor.:25.  
*Trioza nigra*: Miyatake, 1971a, Bull. Osaka Mus. Nat. Hist. 24:1, 3-4 ①.  
*Trioza nigra*: Baba et Miyatake, 1971, Bull. Osaka Mus. Nat. Hist. 24:10 (Korea).  
*Trioza nigra*: Klimaszewski, 1973, Ann. Zool. 30(7):256.  
*Trioza nigra*: Miyatake, 1976, Lif. Tsushima Is.:494 (Korea).  
*Trioza nigra*: Miyatake, 1977, Col. Ill. Ins. Jap. 2:165, pl. 38(618) (Korea).  
*Trioza nigra*: Ed. Dep. Hokuryukan, 1979, Ill. Ins. Jap. Stud. ed.:93 (Korea).  
*Trioza nigra*: Miyatake, 1979, Ins. Niigata Pref. 50:220.  
*Trioza nigra*: Park et al., 1979, Nat. & Life. 9(2):107 ②.  
*Trioza nigra*: Park et al., 1980b, Ibid. 10(1):9 ③-⑦.  
*Trioza nigra*: Kwon et Lee, 1981, Kor. Journ. Plant Prot. 20(3):160 ⑧-⑬.

**Type-locality:** Japan.

**Description:** General coloration black, with bright markings on pterothorax, and hindtibiae; vertex and dorsum with long hairs sparsely scattered.

Vertex very slightly exceeding half as long as wide, deeply incised at apical half of median suture, with discal impressions angulately concave at next to posterior margin, prominently elevated at lateral ocelli. Genal cones slender, about as long as vertex, well divergent and sharply terminated. Antennae about 1.6 to 1.8 times as long as width of head including eyes, with basal 2 segments brown, remainder black.

Forewings elongate, narrow at base, widest at middle to apical third; surface spinules greatly reduced, only present in basal cells (pb and cu<sub>2</sub>); vein Rs long, bisinuate, exceeding half of M<sub>1+2</sub>; cell m<sub>2</sub> a little smaller than cu<sub>1</sub>.

Male proctiger roundly extended posteriorly, with long pubescence on posterior margin. Parameres somewhat broad, with apices bluntly narrowed and armed with a spine-like process directed anterad. Aedeagus with distal segment more or less stout, apex roundly curved downwards.

Female genitalia longer than wide. Proctiger narrowed to apex, with dorsal side somewhat broadly concave in lateral view; length of anus exceeding half as long as remainder of proctiger. Subgenital plate sharply terminated.

**Length:** Body male 1.9-2.0mm, female 2.2-2.5mm; to tip of folded wings male 3.7-3.9mm, female 3.9-4.1mm.

**Locality:** CB : Danyang, Mt. Sogilsan.

CN : Mt. Deongsungsan, Mt. Gyeryongsan ⑬.

GB : Andong, Mt. Bohyeonsan, Daegu, Mt. Whangaksan (= Mt. Hwanghagsan) ⑭, Hyoryeong Myeon, Mt. Juwangsan, Kachang (= Gachang vic. Daegu) ⑮, Mt. Naeyeonsan, Mt. Palgongsan ⑯, Mt. Sansungsan (= Mt. Sanseongsan vic. Daegu) ⑰, Mt. Sobaegsan, Songrimsa Temple (= Songlimsa Temple vic. Daegu) ⑱, Mt. Sudosan ①, Mt. Tohamsan, Unmoonsa Temple (= Unmunsa Temple) ②, Urock (= Urog vic. Daegu) ③, Yongyeonsa Temple ④.

GG : Mt. Chilbosan, Is. Ganghwado, Gwangleung, Mt. Myeongseongsan, Seoul, Mt. Soyosan, Suweon.

GN : Mt. Gajisan ①, Mt. Gayasan, Geochang, Mt. Geumjeongsan, Mt. Geumsan, Mt.

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Jirisan <sup>15</sup>, Masan, Samnam Myeon, Mt. Sinbulsan <sup>9</sup>, Mt. Weonhyosan <sup>8</sup>, Mt. Yeongchuisan <sup>10</sup>.

GW : Mt. Chiagsan, Chuncheon, Mt. Obongsan, Mt. Odaesan, Mt. Seolagsan.

JB : Mt. Daedunsan, Mt. Deogyusan, Mt. Mayisan, Mt. Naejangsan.

JJ : Mt. Hanlasan <sup>17</sup>.

JN : Is. Hongdo <sup>18</sup>, Mt. Mudeungsan <sup>16</sup>.

Distribution: Korea, Japan (Hokkaido, Honshu, Kyushu, Shikoku, Ryukyus, Tsushima).

Host-plant: *Styrax japonica*, *S. obassia*, *Symplocos koreana*.

81. *Trioza mayicola* Kwon et Lee, 1981 (Mayisan-namui)

*Trioza mayicola* Kwon et Lee, 1981, Kor. Journ. Plant Prot. 20(3):160-161 <sup>1</sup>.

Type-locality: Korea.

Description: General coloration dirty yellowish orange, with prominent dark brown markings on vertex, dorsum and most of abdominal segments.

Vertex distinctly longer than half as long as wide, deeply incised anteriorly on median suture, with prominent pit-like discal impressions at next to middle. Eyes dark brown. Genal cones short, almost half as long as vertex, distal half somewhat paler, slightly divergent apically. Antennae strikingly short, less than width of head including eyes, usually pale yellowish brown, with apical 2 segments and distal half of 8th segment dark brown.

Forewings long, narrow basally, widest at middle, somewhat acutely terminated; surface spinules only present in basal cells (pb and cu2); Vein Rs very long, exceeding half of  $M_{1+2}$ , wavy and bisinuate; M nearly twice as long as Cul; cell cul larger than m2. Legs dirty yellowish with obscure brown markings.

Female genitalia about as broad as long. Proctiger dark brown, with dorsum broadly concave next to anus, narrowed to apex which somewhat dully terminated; length of anus a little shorter than remainder of proctiger. Subgenital plate slightly less than proctiger.

Length: Body female 2.09mm; to tip of folded wings female 3.47mm.

Locality: JB : Mt. Mayisan <sup>1</sup>.

Distribution: Korea.

Host-plant: Unknown.

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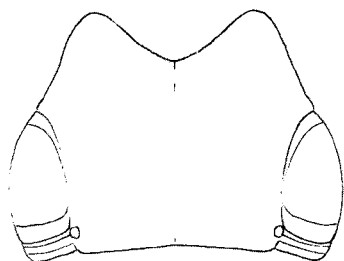
PLATE \_\_\_\_\_

Plate I.

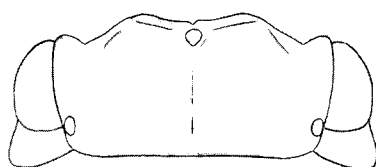
Head structure of psylloids in dorsal aspect (1).

1. *Livia jesoensis* Matsumura, 1908
2. *Syringilla humerosa* (Loginova, 1967)
3. *Koreaphalara koreana* Kwon gen. et sp. nov.
4. *Aphalara polygoni* Foerster, 1848
5. *Aphalara itadori* (Shinji, 1938)
6. *Aphalara jungsukae* Kwon sp. nov.
7. *Aphalara fasciata* Kuwayama, 1908
8. *Craspedolepta flava* (Kuwayama, 1908)
9. *Craspedolepta conspersa* (Loew, 1888)
10. *Anomoneura mori* Schwarz, 1896
11. *Euphalerus robinae* (Shinji, 1938)
12. *Acizzia sasakii* (Miyatake, 1963)
13. *Acizzia jamatonica* (Kuwayama, 1908)
14. *Cyamophila hexastigma* (Horváth, 1899)
15. *Psylla alni* (Linnaeus, 1758)

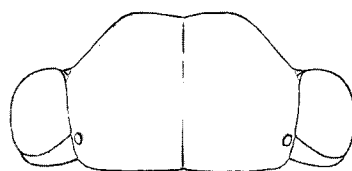
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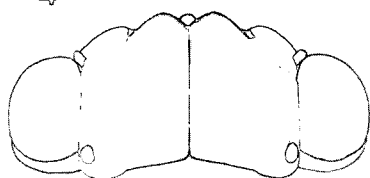
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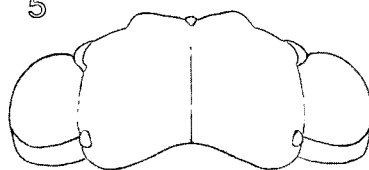
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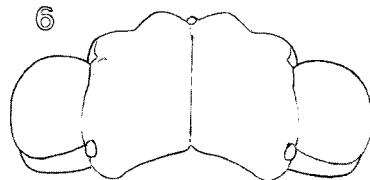
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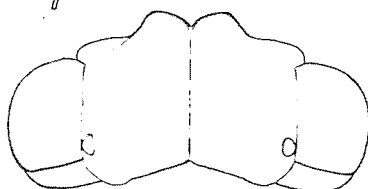
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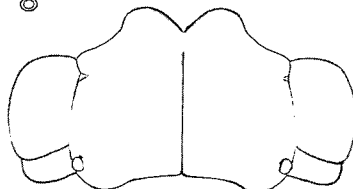
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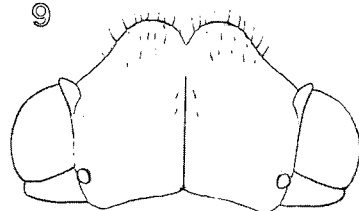
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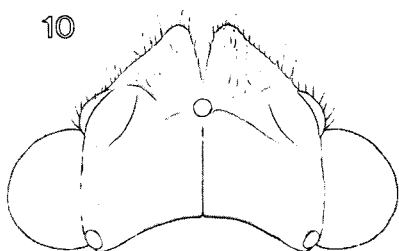
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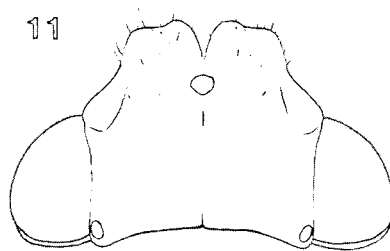
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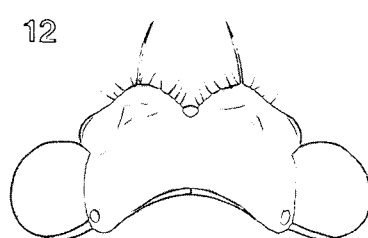
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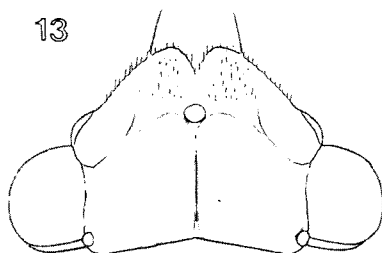
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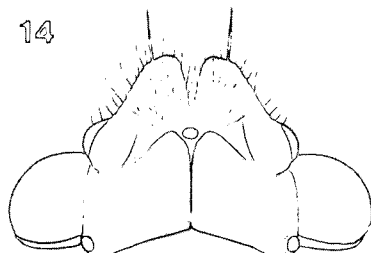
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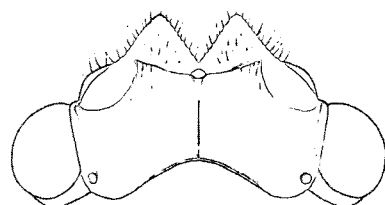




Plate III.

Head structure of psylloids in dorsal aspect (2).

1. *Psylla pyrisuga* Foerster, 1848
2. *Psylla mali* (Schmidberger, 1836)
3. *Psylla peninsularis* Kwon sp. nov.
4. *Psylla peninsularis hanlasanensis* Kwon sp. et ssp. nov.
5. *Psylla fulguralis* Kuwayama, 1908
6. *Psylla elaeagni* Kuwayama, 1908
7. *Psylla hanlabori* Kwon sp. nov.
8. *Psylla elaeagnicola* Miyatake, 1963 (from Mt. Palgongsan).
9. *Psylla palgongsana* Kwon sp. nov.
10. *Psylla pseudoviburni* Kwon sp. nov.
11. *Psylla juwangsana* Kwon sp. nov.
12. *Psylla fatsiae* Jensen, 1957
13. *Psylla seungmoi* Kwon sp. nov.
14. *Psylla seonhyeongae* Kwon sp. nov.
15. *Psylla silvestris* Kwon sp. nov.

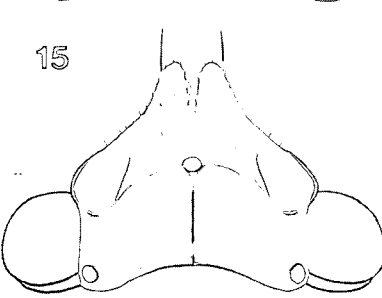
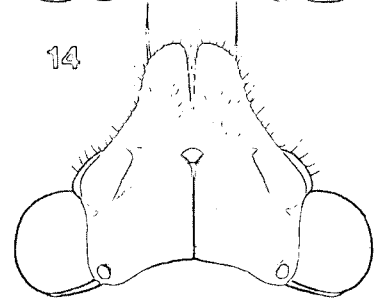
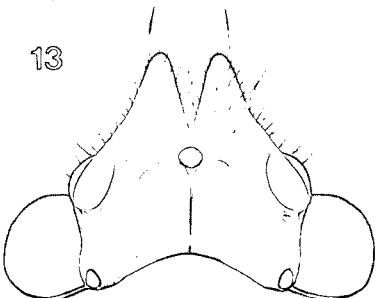
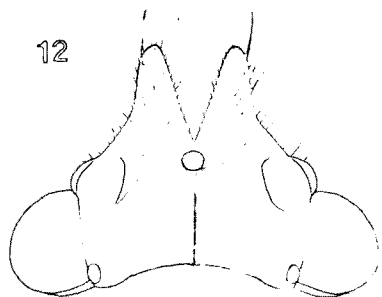
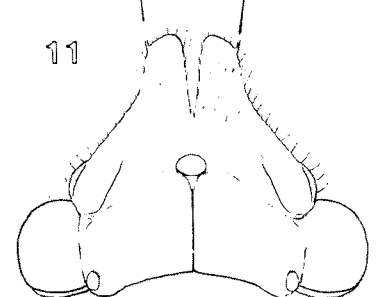
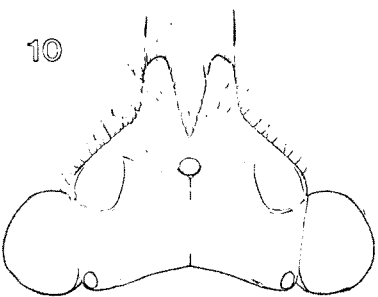
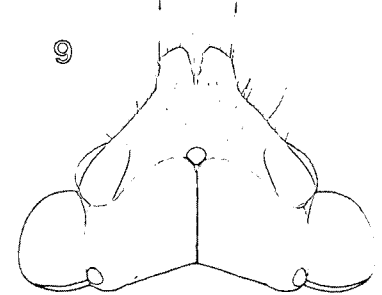
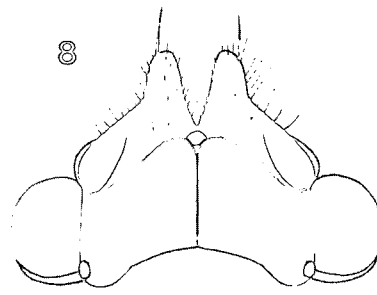
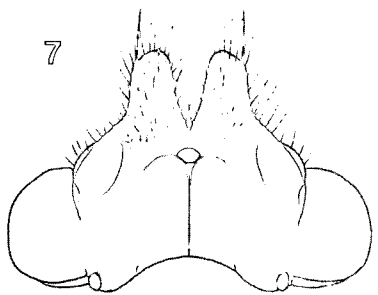
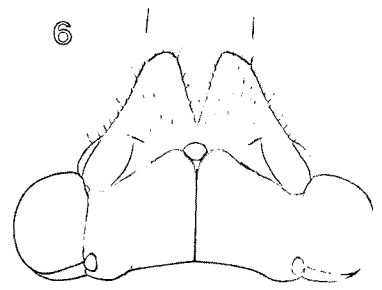
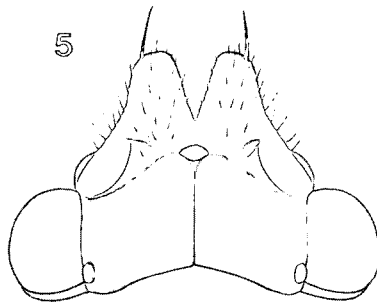
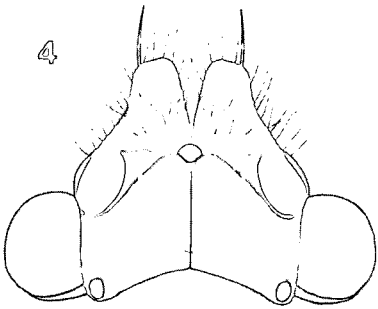
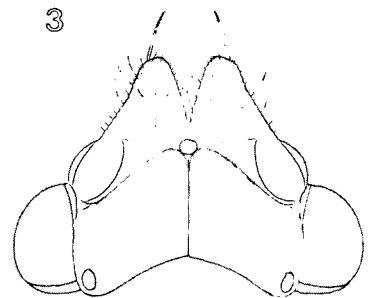
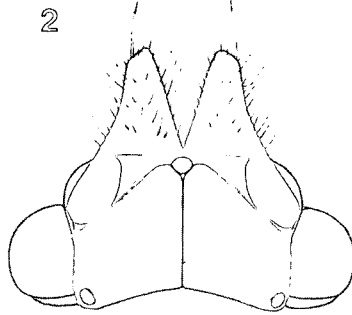
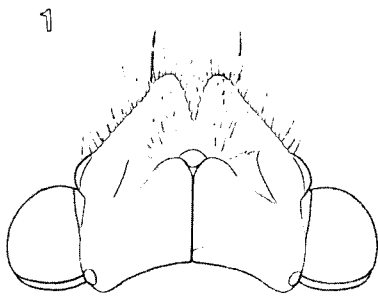


Plate III.

Head structure of psylloids in dorsal aspect (3).

1. *Psylla ambigua* Foerster, 1848
2. *Psylla tobirae* Miyatake, 1964
3. *Psylla rhododendri* Puton, 1871
4. *Psylla seolagsana* Kwon sp. nov.
5. *Psylla koreacola* Kwon sp. nov.
6. *Psylla coccinea* Kuwayama, 1908
7. *Psylla quelparticola* Kwon sp. nov.
8. *Psylla ulleungensis* Kwon sp. nov.
9. *Psylla bibari* Kwon sp. nov.
10. *Psylla pyricola* Foerster, 1848
11. *Psylla jukyungi* Kwon sp. nov.
12. *Psylla hederæ* Miyatake, 1964
13. *Psylla lineaticeps* Kwon sp. nov.
14. *Psylla abietis* Kuwayama, 1908
15. *Psylla truncaticephala* Kwon sp. nov.

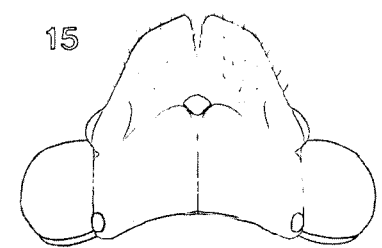
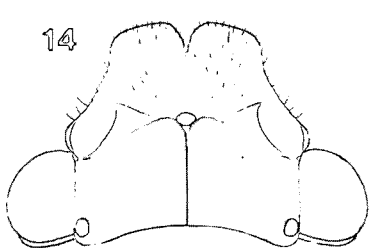
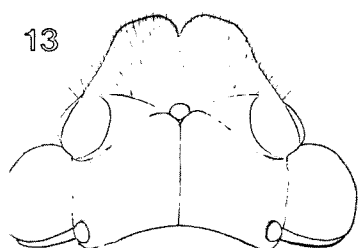
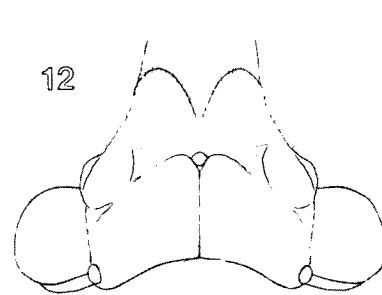
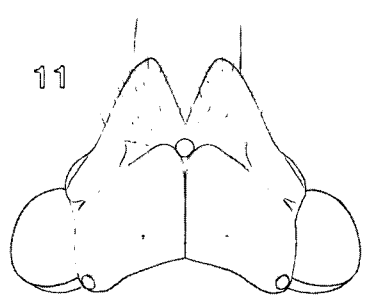
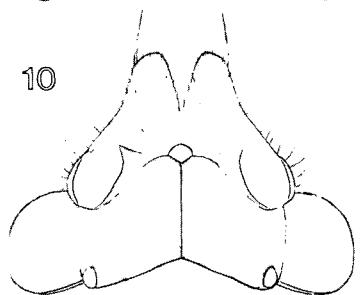
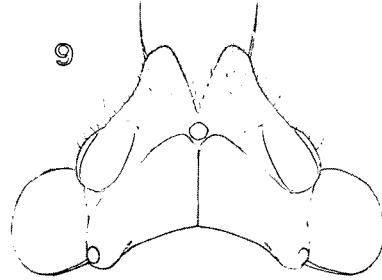
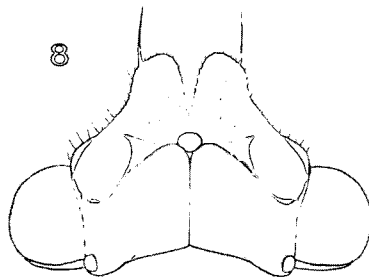
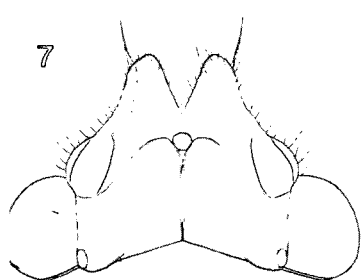
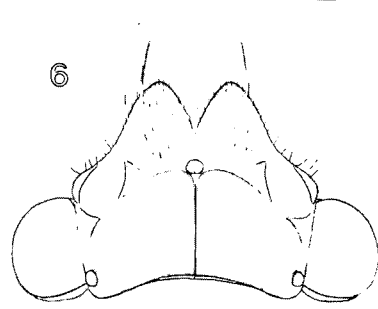
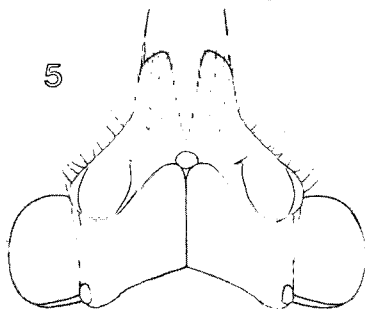
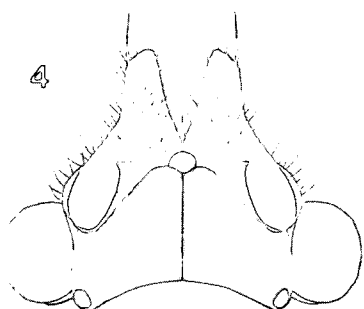
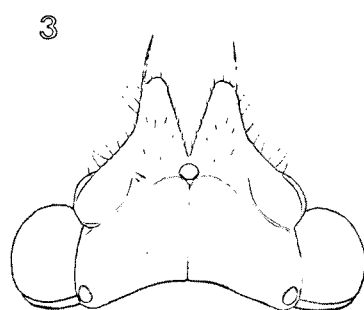
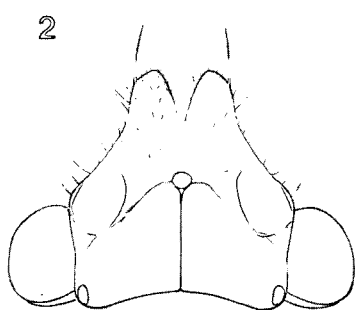
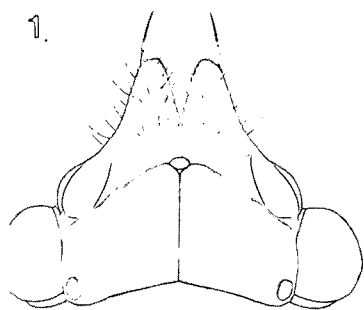


Plate IV.

Head structure of psylloids in dorsal aspect (4).

1. *Psylla obongsana* Kwon sp. nov.
2. *Psylla kwonnabiae* Kwon sp. nov.
3. *Psylla sangjaei* Kwon sp. nov.
4. *Psylla subcoccinea* Kwon sp. nov.
5. *Psylla nopeunsanicola* Kwon sp. nov.
6. *Psylla elaeagnicola* Miyatake, 1963 (from Mt. Hanlasan).
7. *Psylla elaeagnicola* Miyatake, 1963 (from Samnam Myeon).
8. *Psylla elaeagnicola* Miyatake, 1963 (from Samnam Myeon).
9. *Psylla elaeagnicola* Miyatake, 1963 (from Mt. Hanlasan).
10. *Pachypsylla japonica* Miyatake, 1968
11. *Calophya verticornis* Kwon sp. nov.
12. *Calophya shinjii* Sasaki, 1954
13. *Bactericera brevitiformis* Kwon sp. nov.
14. *Bactericera nobilis* Kwon sp. nov.
15. *Heterotrioza chilgia* (Park et Lee, 1980)

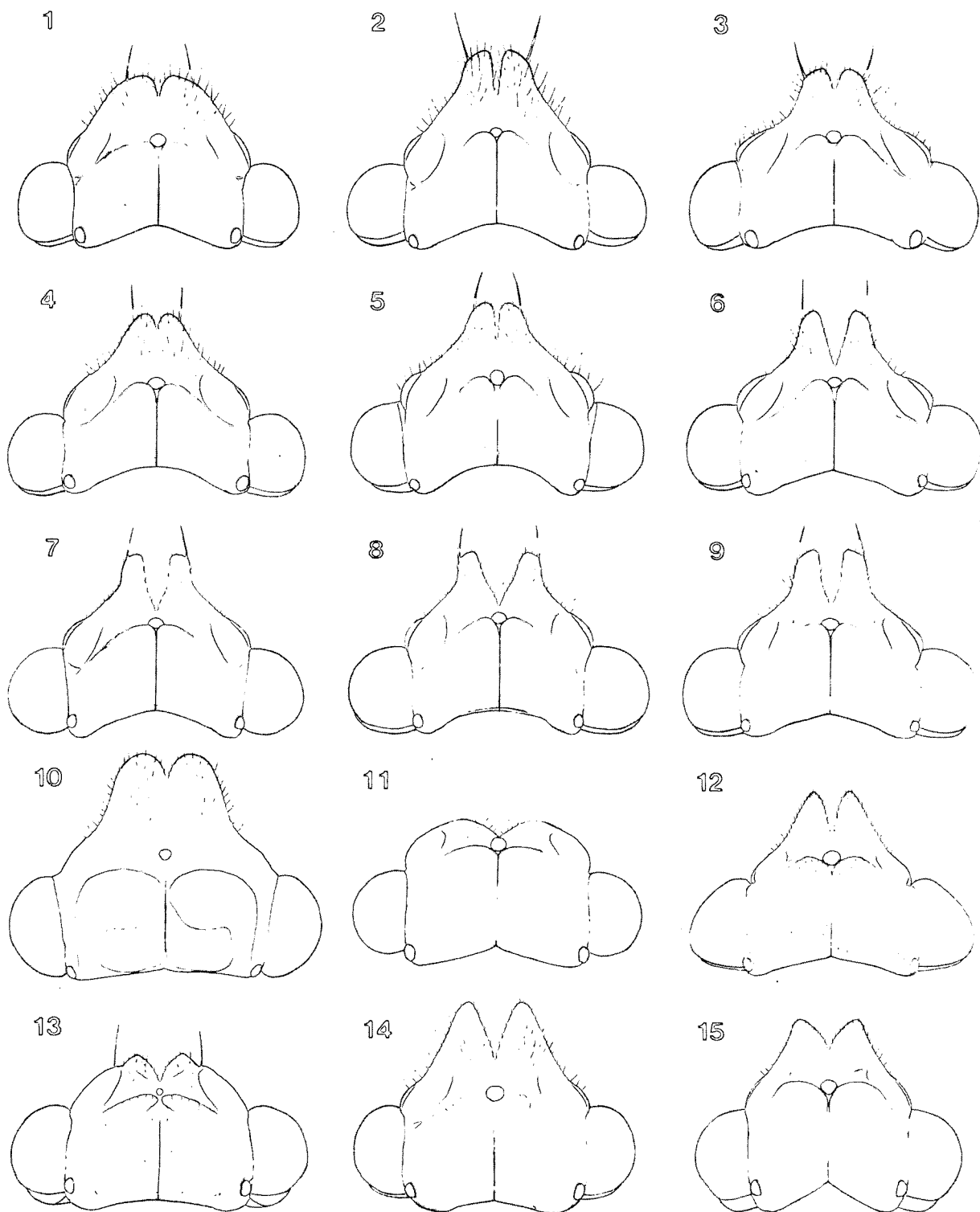
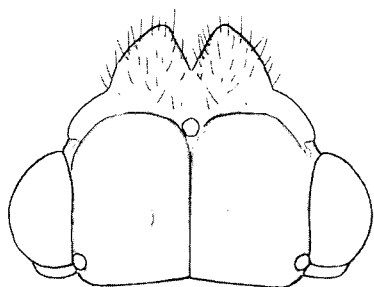


Plate V.

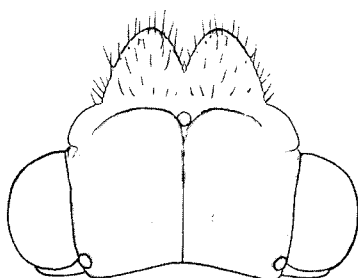
Head structure of psylloids in dorsal aspect (5).

1. *Epitrioza mizuhonica* Kuwayama, 1910
2. *Epitrioza yasumatsui* Miyatake, 1978
3. *Trichochermes grandis* Loginova, 1965
4. *Bactericera distinctissima* Kwon et Lee, 1981
5. *Bactericera myohyangi* (Klimaszewski, 1968)
6. *Bactericera calcarata* (Schaefer, 1949)
7. *Bactericera miyatakei* Kwon et Lee, 1981
8. *Bactericera koreostriola* Kwon sp. nov.
9. *Bactericera yamagishii* Kwon et Lee, 1981
10. *Heterotrioza obliqua* (Thomson, 1877)
11. *Heterotrioza noknamui* Kwon et Lee, 1981
12. *Trioza breviata* Kwon et Lee, 1981
13. *Trioza abdominalis* Flor, 1861
14. *Trioza nigra* Kuwayama, 1910
15. *Trioza mayicola* Kwon et Lee, 1981

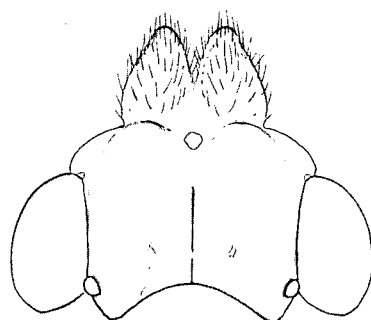
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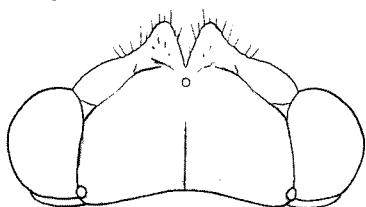
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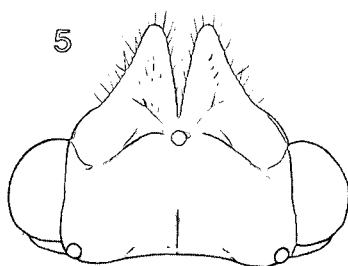
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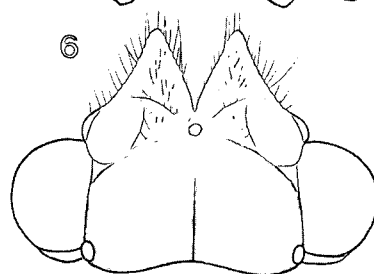
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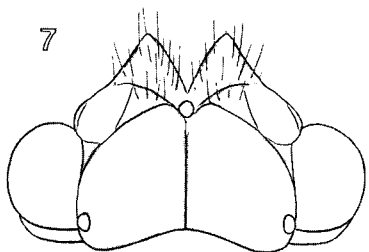
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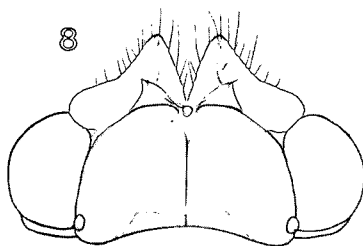
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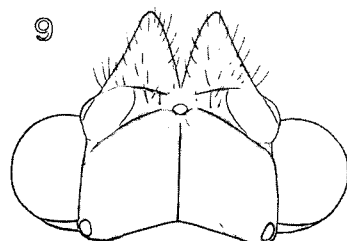
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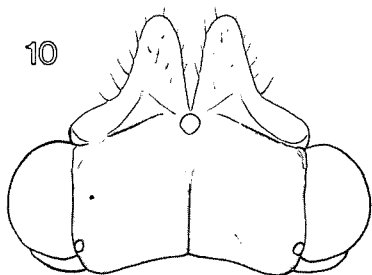
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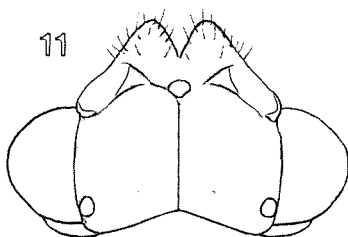
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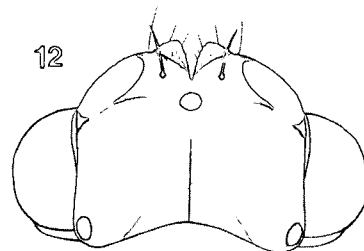
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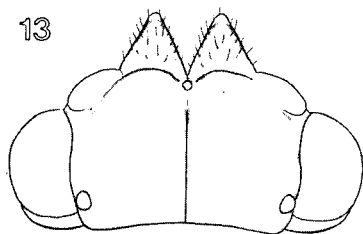
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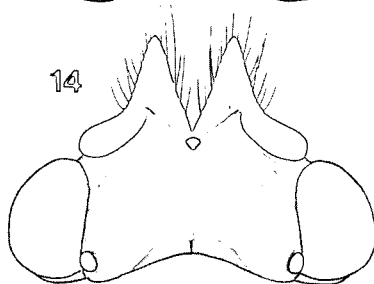
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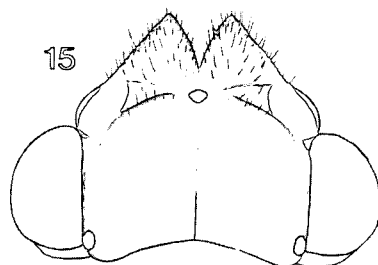
13



14



15





## Plate VI.

### Forewings of psylloids (1).

1. *Livia jesoensis* Matsumura, 1908
2. *Syntomoza magna* (kuwayama, 1908)
3. *Syringilla humerosa* (Loginova, 1967)
4. *Koreaphalara koreana* Kwon gen. et sp. nov.
5. *Aphalara polygoni* Foerster, 1848
6. *Aphalara itadori* (Shinji, 1938)
7. *Aphalara jungsukae* Kwon sp. nov.
8. *Aphalara fasciata* Kuwayama, 1908
9. *Craspedolepta flava* (Kuwayama, 1908)
10. *Craspedolepta conspersa* (Loew, 1888)
11. *Anomoneura mori* Schwarz, 1896
12. *Euphalerus robinae* (Shinji, 1938)

PLATE VI

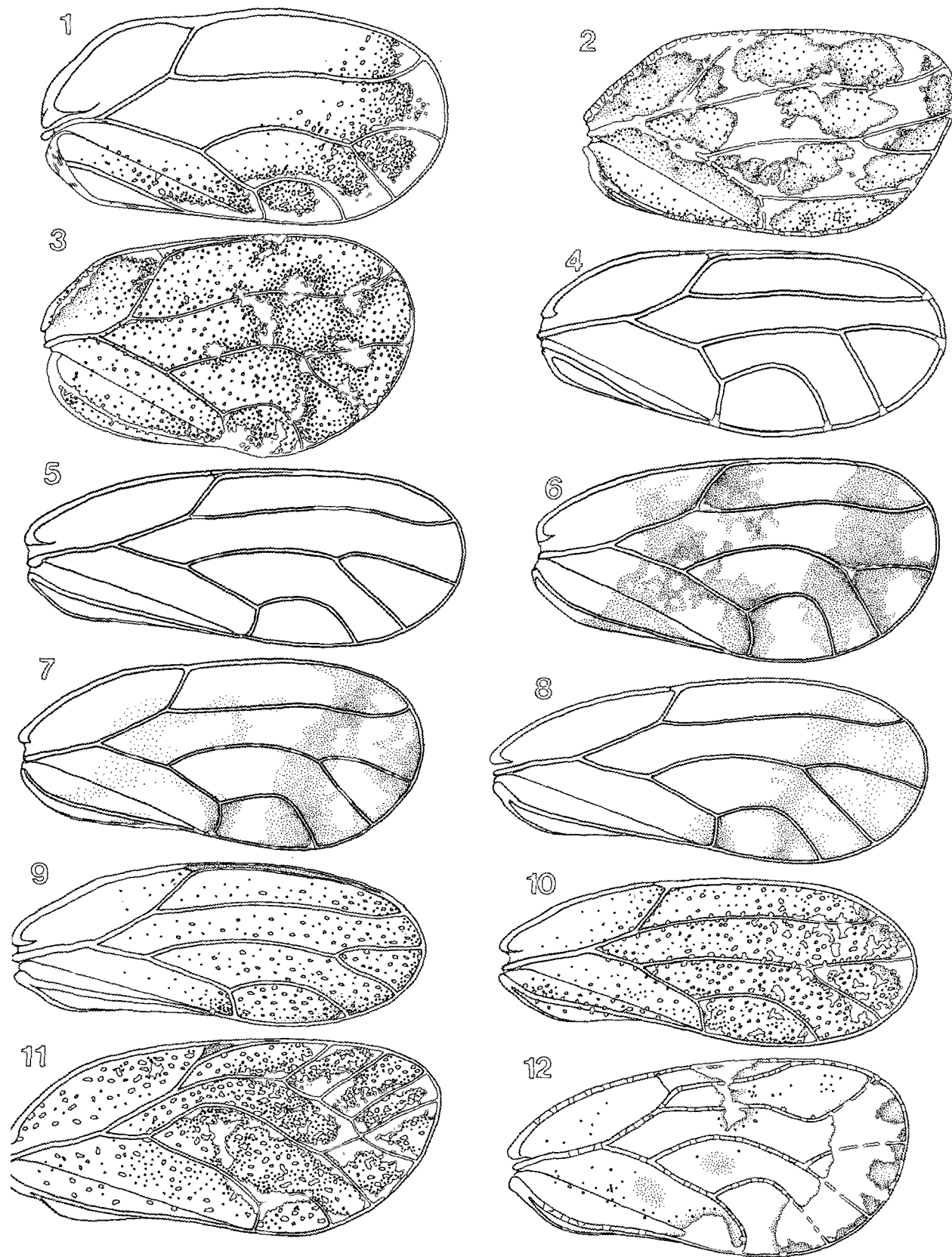
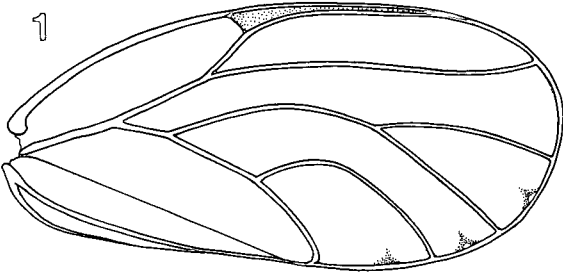


Plate VII.

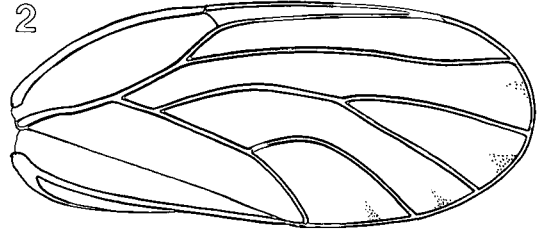
Forewings of psylloids (2).

1. *Acizzia sasakii* (Miyatake, 1963)
2. *Acizzia jamatonica* (Kuwayama, 1908) (from Hayang Eub; summer form).
3. *Acizzia jamatonica* (Kuwayama, 1908) (from Mt. Mayisan; overwintering form).
4. *Cyamophila hexastigma* (Horváth, 1899)
5. *Psylla alni* (Linnaeus, 1758)
6. *Psylla pyrisuga* Foerster, 1848
7. *Psylla mali* (Schmidberger, 1836)
8. *Psylla peninsularis* Kwon sp. nov.
9. *Psylla peninsularis hanlasanensis* Kwon sp. et ssp. nov.
10. *Psylla fulguralis* Kuwayama, 1908
11. *Psylla elaeagni* Kuwayama, 1908
12. *Psylla hanlabori* Kwon sp. nov.

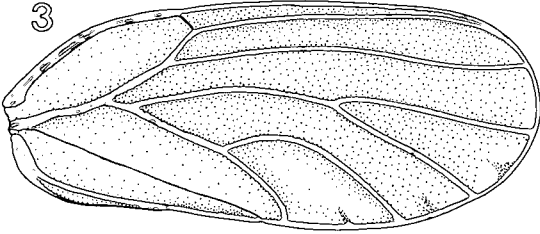
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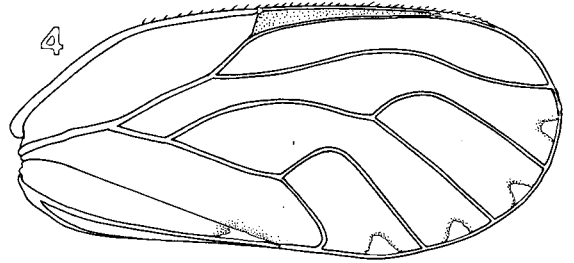
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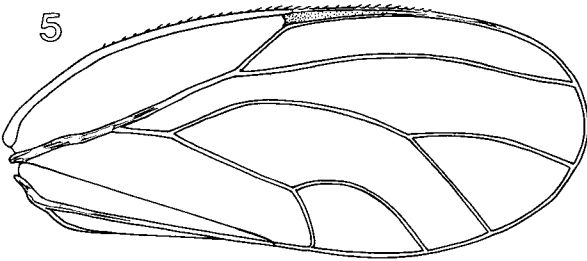
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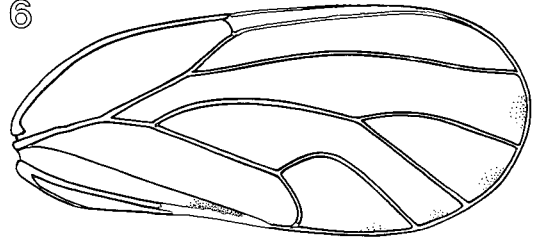
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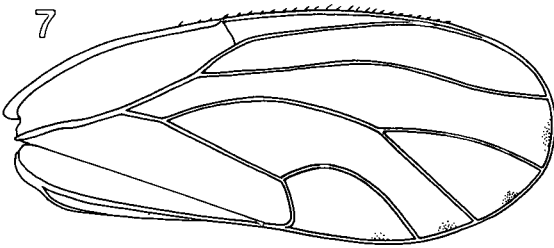
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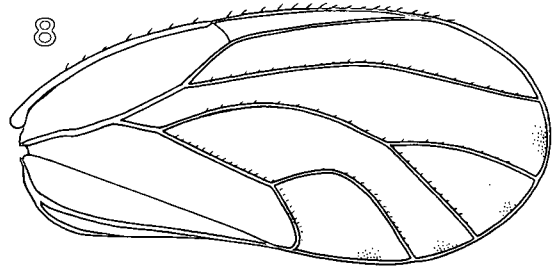
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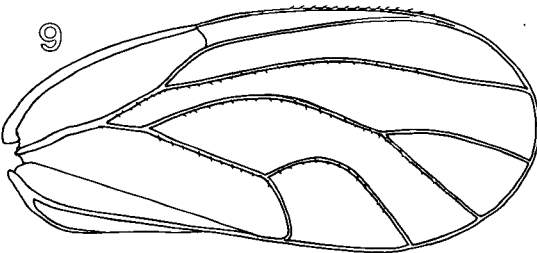
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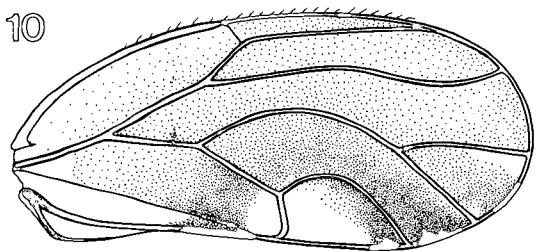
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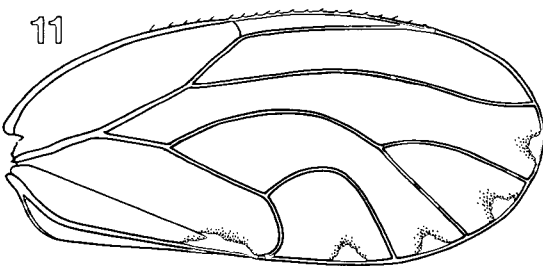
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10



11



12

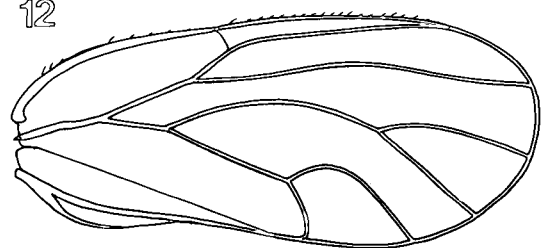
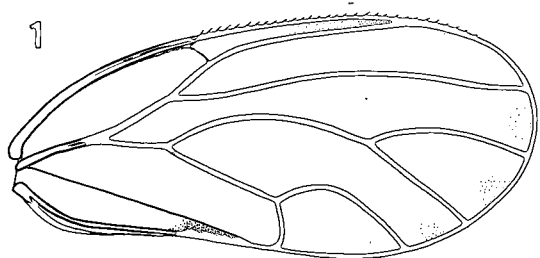


Plate VIII.

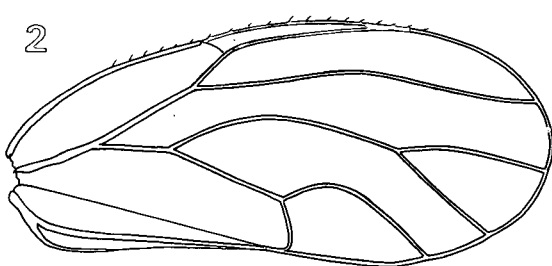
Forewings of psylloids (3).

1. *Psylla elaeagnicola* Miyatake, 1963
2. *Psylla palgongsana* Kwon sp. nov.
3. *Psylla pseudoviburni* Kwon sp. nov.
4. *Psylla juwangsana* Kwon sp. nov.
5. *Psylla fatsiae* Jensen, 1957
6. *Psylla seungmoi* Kwon sp. nov.
7. *Psylla seonhyeongae* Kwon sp. nov.
8. *Psylla silvestris* Kwon sp. nov.
9. *Psylla ambigua* Foerster, 1848
10. *Psylla tobirae* Miyatake, 1964
11. *Psylla rhododendri* Puton, 1871
12. *Psylla seolagsana* Kwon sp. nov.

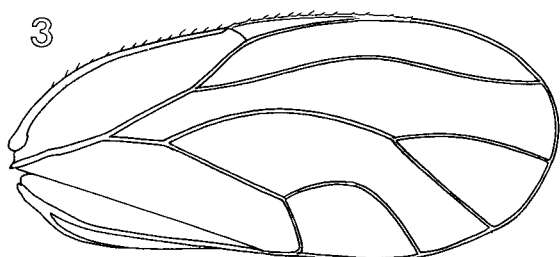
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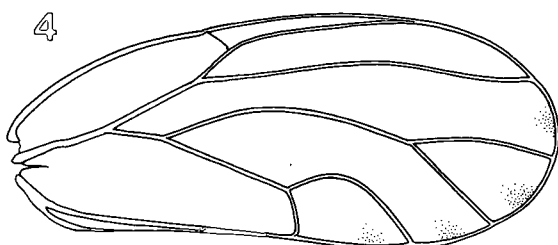
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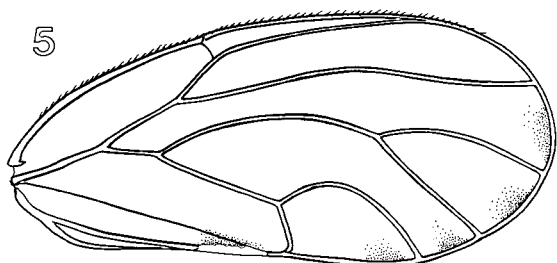
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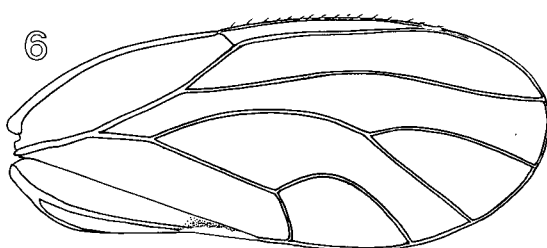
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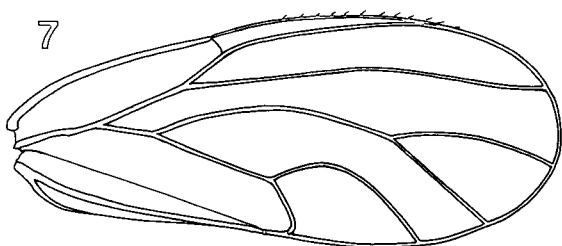
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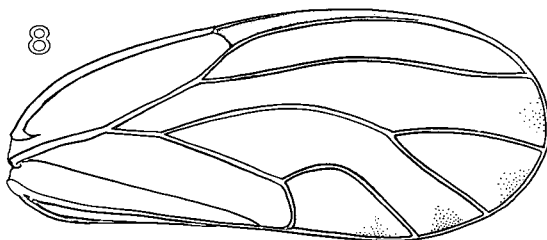
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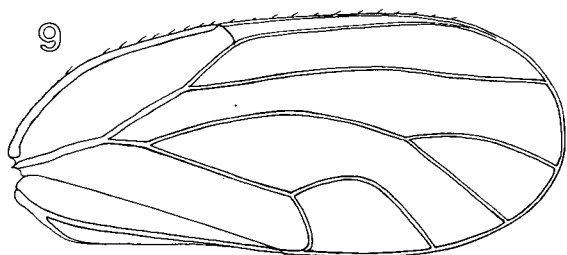
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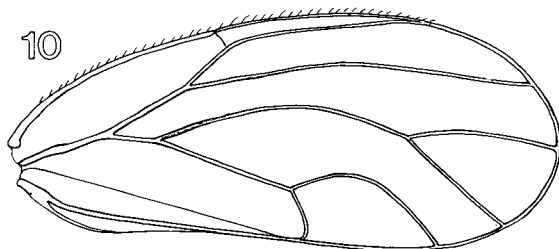
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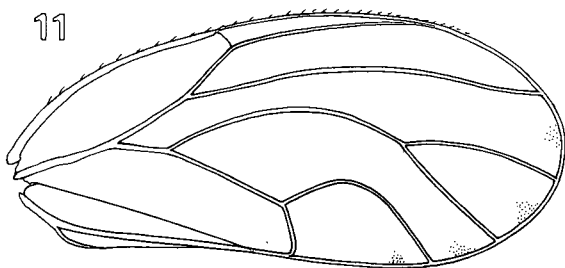
9



10



11



12

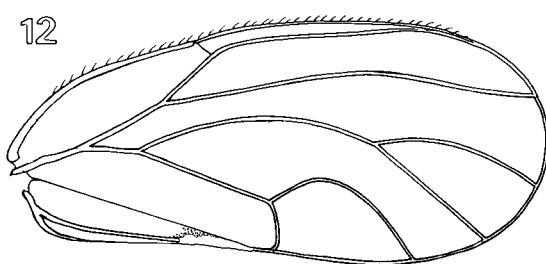


Plate IX.

Forewings of psylloids (4).

1. *Psylla koreacola* Kwon sp. nov.
2. *Psylla coccinea* Kuwayama, 1908
3. *Psylla quelparticola* Kwon sp. nov.
4. *Psylla ulleungensis* Kwon sp. nov.
5. *Psylla bibari* Kwon sp. nov.
6. *Psylla pyricola* Foerster, 1848
7. *Psylla jukyungi* Kwon sp. nov.
8. *Psylla hederæ* Miyatake, 1964
9. *Psylla lineaticeps* Kwon sp. nov.
10. *Psylla abietis* Kuwayama, 1908
11. *Psylla truncaticephala* Kwon sp. nov.
12. *Psylla obongsana* Kwon sp. nov.

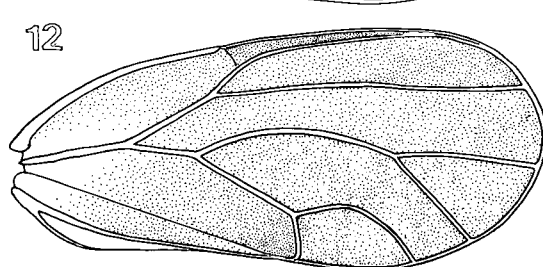
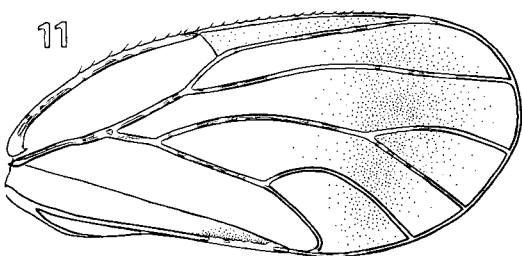
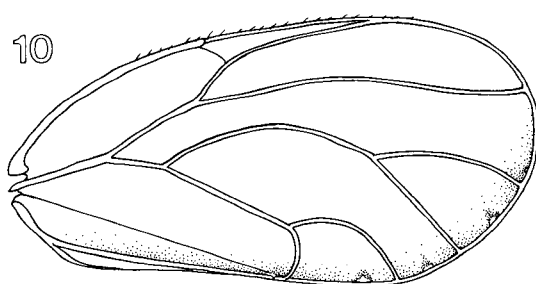
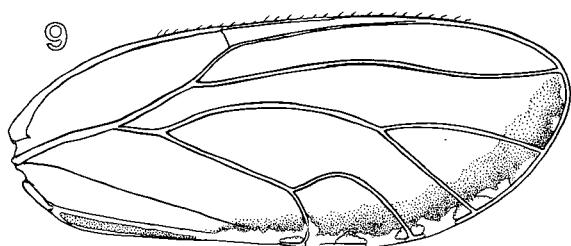
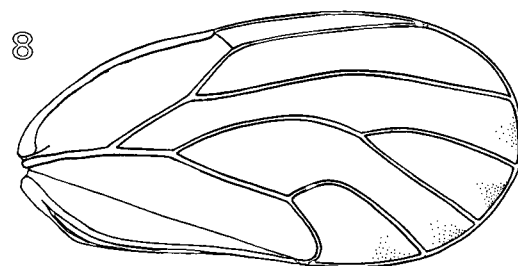
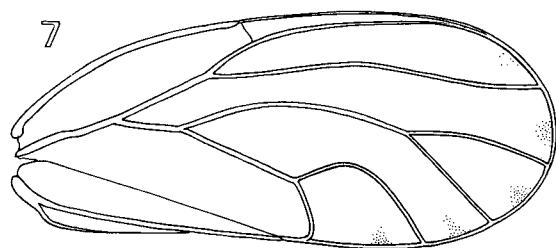
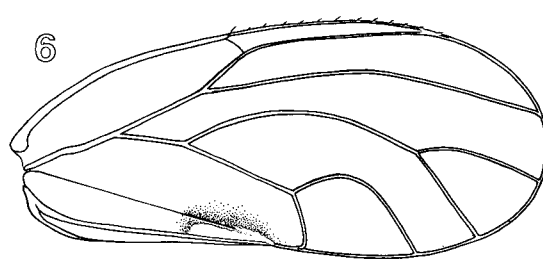
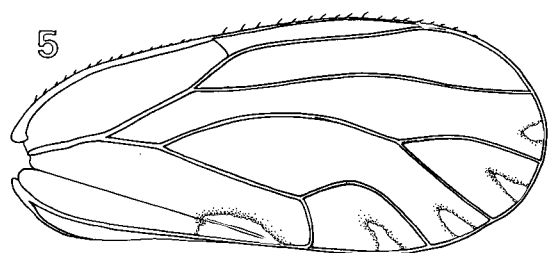
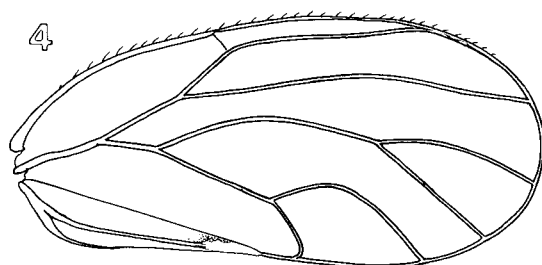
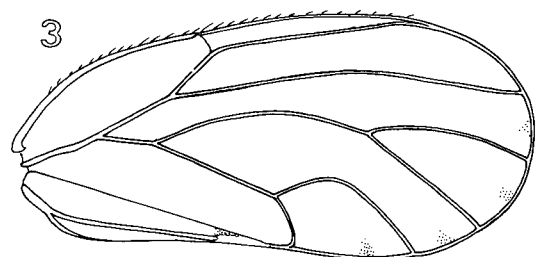
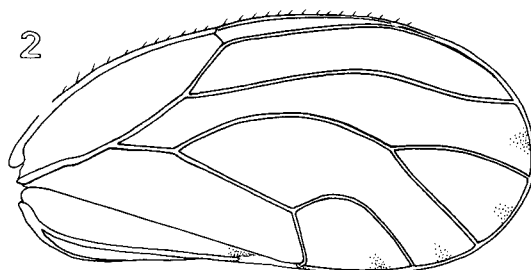
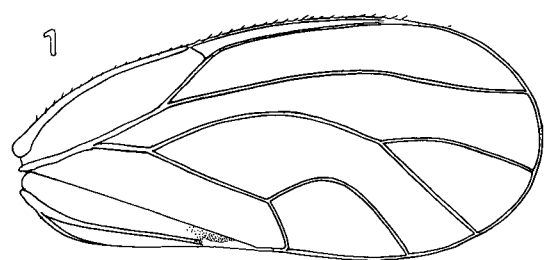




Plate X.

Forewings of psylloids (5).

1. *Psylla kwonnabiae* Kwon sp. nov.
2. *Psylla sangjaei* Kwon sp. nov.
3. *Psylla nopeunsanicola* Kwon sp. nov.
4. *Psylla subcoccinea* Kwon sp. nov.
5. *Pachypsylla japonica* Miyatake, 1968
6. *Calophya verticornis* Kwon sp. nov.
7. *Calophya shinjii* Sasaki, 1954
8. *Epitrioza mizuhonica* Kuwayama, 1910
9. *Epitrioza yasumatsui* Miyatake, 1978
10. *Trichohermes grandis* Loginova, 1965
11. *Bactericera distinctissima* Kwon et Lee, 1981
12. *Bactericera myohyangi* (Klimaszewski, 1968)

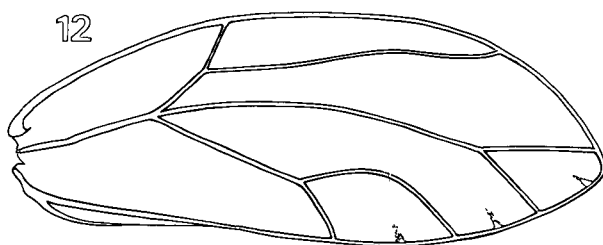
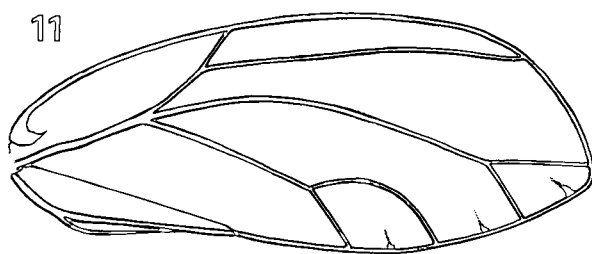
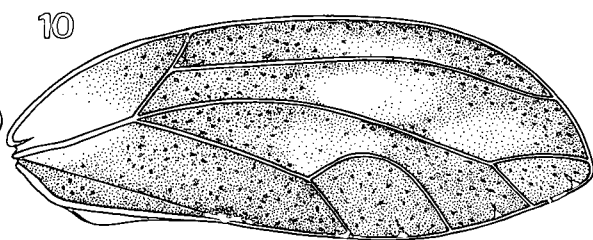
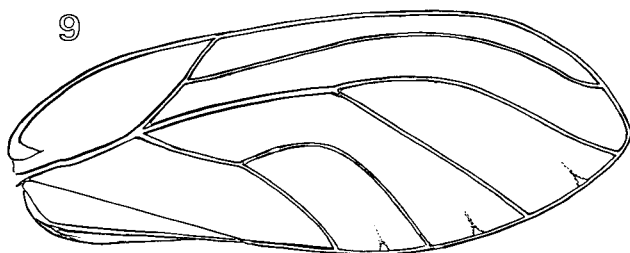
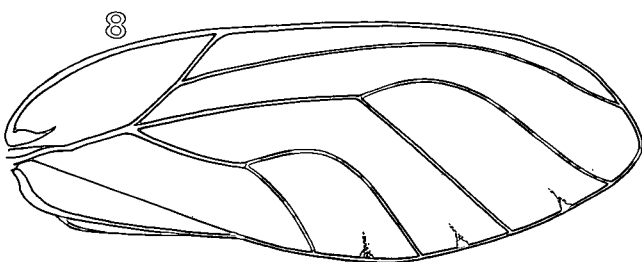
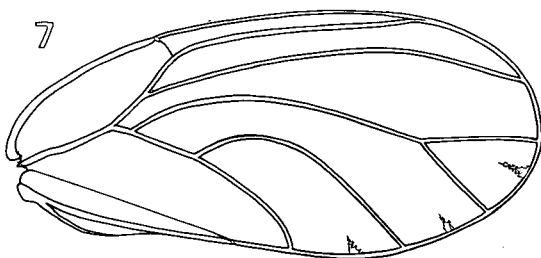
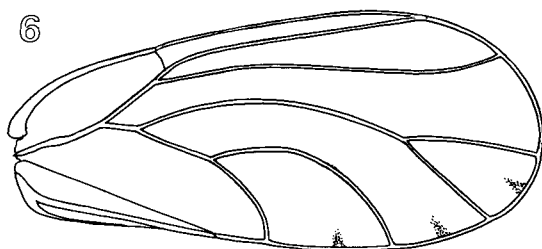
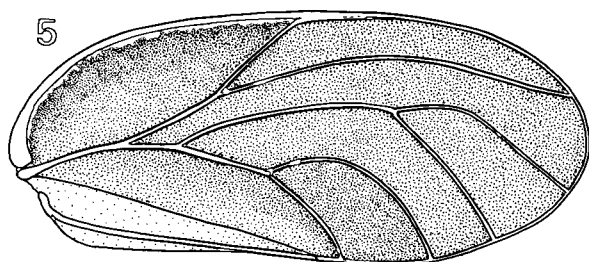
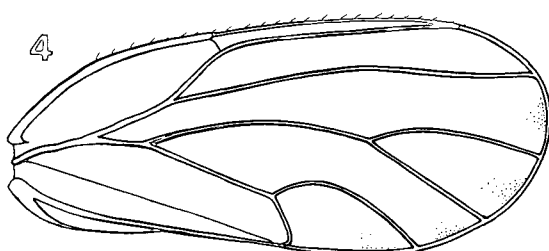
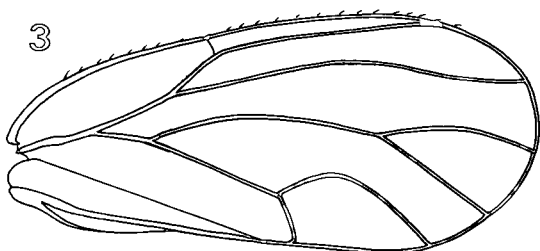
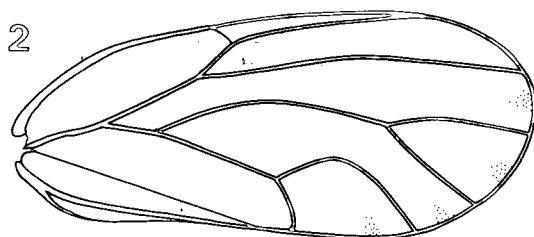
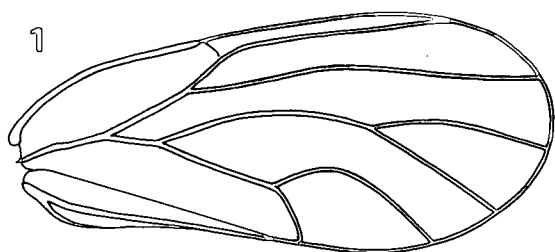


Plate XII.

Forewings of psylloids (6).

1. *Bactericera brevitiformis* Kwon sp. nov.
2. *Bactericera calcarata* (Schaefer, 1949)
3. *Bactericera miyatakei* Kwon et Lee, 1981
4. *Bactericera koreostriola* Kwon sp. nov.
5. *Bactericera nobilis* Kwon sp. nov.
6. *Bactericera yamagishii* Kwon et Lee, 1981
7. *Heterotrioza obliqua* (Thomson, 1877)
8. *Heterotrioza chilgia* (Park et Lee, 1980)
9. *Heterotrioza noknamui* Kwon et Lee, 1981
10. *Trioza abdominalis* Flor, 1861
11. *Trioza nigra* Kuwayama, 1910
12. *Trioza mayicola* Kwon et Lee, 1981

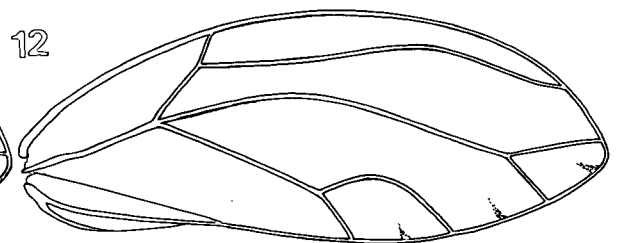
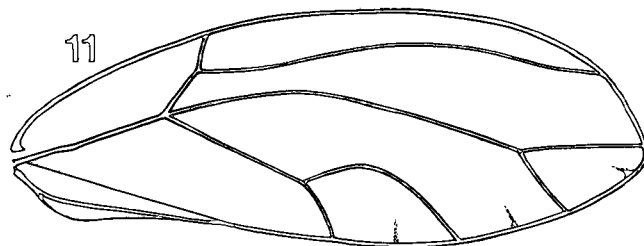
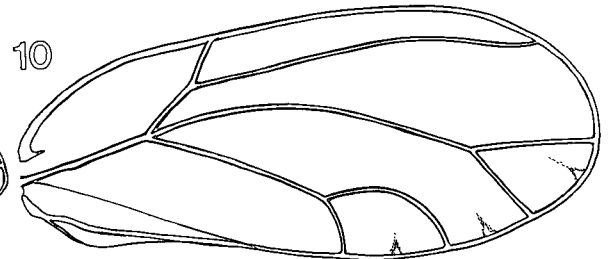
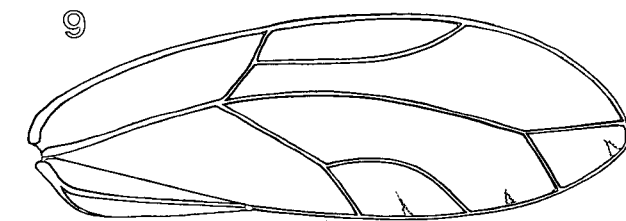
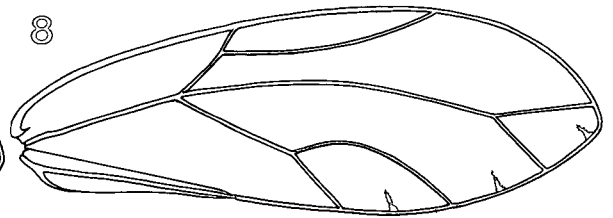
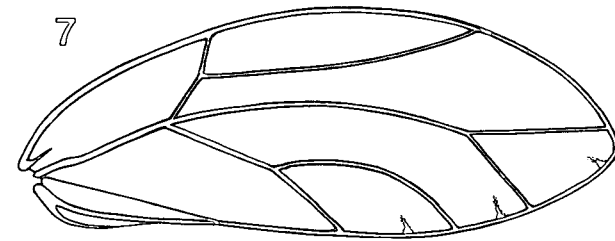
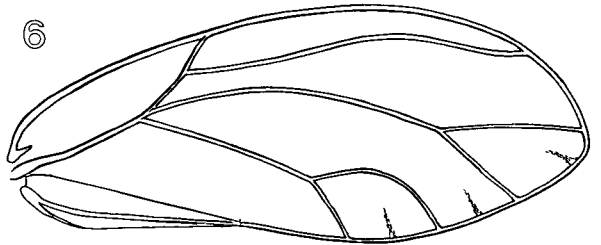
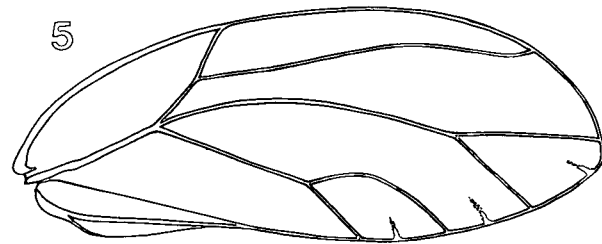
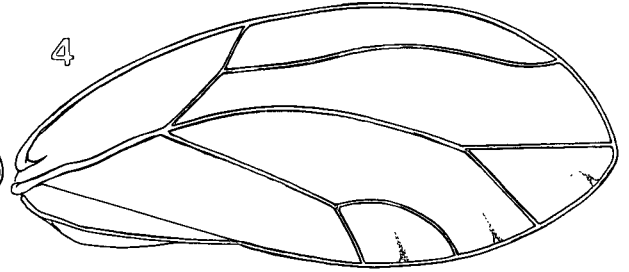
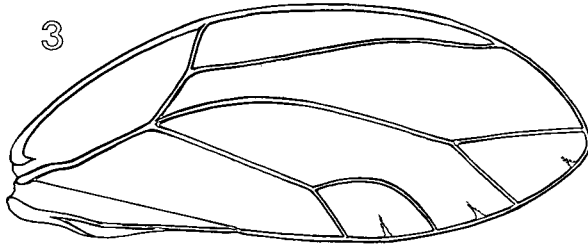
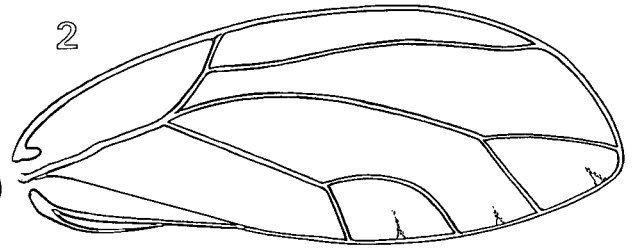
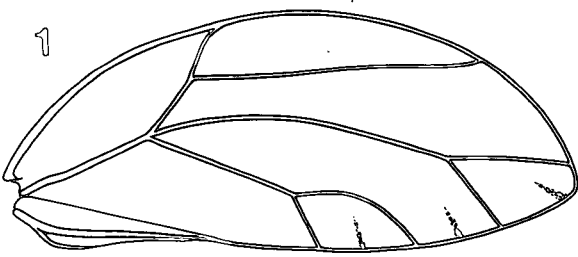


Plate XII.

Hindwings of psylloids (1).

1. *Livia jesoensis* Matsumura, 1908
2. *Syringilla humerosa* (Loginova, 1967)
3. *Koreaphalara koreana* Kwon gen. et sp. nov.
4. *Aphalara polygona* Foerster, 1848
5. *Aphalara itadori* (Shinji, 1938)
6. *Aphalara jungsukae* Kwon sp. nov.
7. *Aphalara fasciata* Kuwayama, 1908
8. *Craspedolepta flava* (Kuwayama, 1908)
9. *Craspedolepta conspersa* (Loew, 1888)
10. *Anomoneura mori* Schwarz, 1896
11. *Euphalerus robiniae* (Shinji, 1938)
12. *Acizzia sasakii* (Miyatake, 1963)

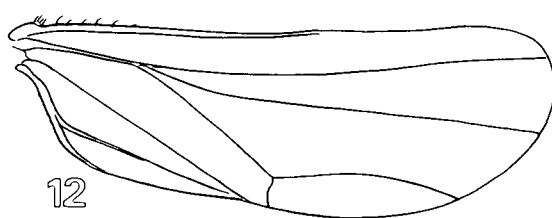
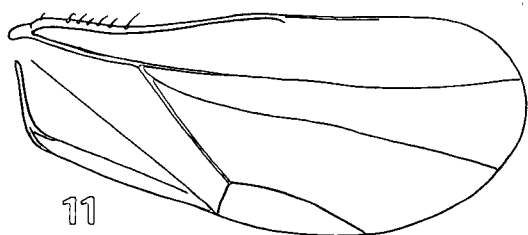
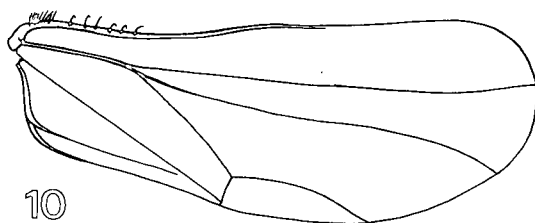
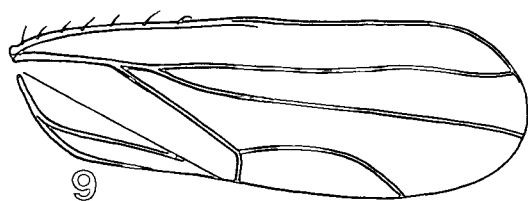
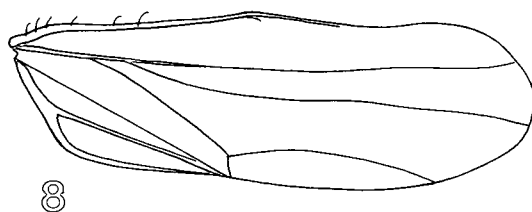
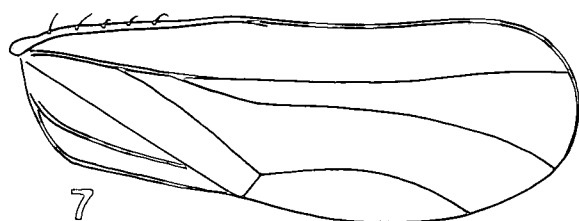
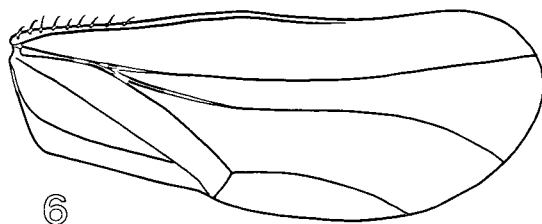
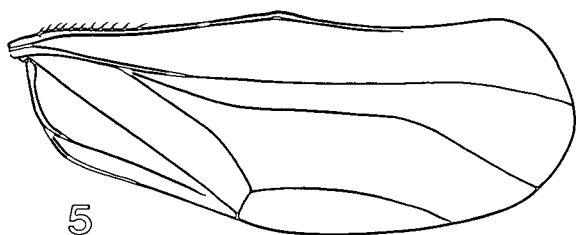
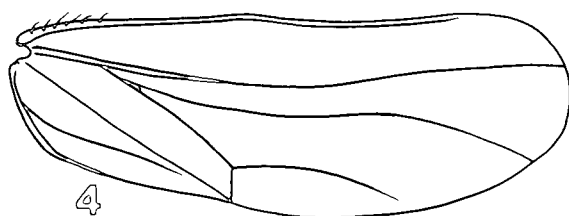
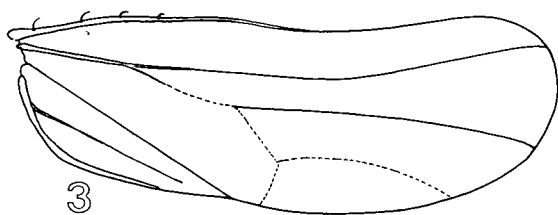
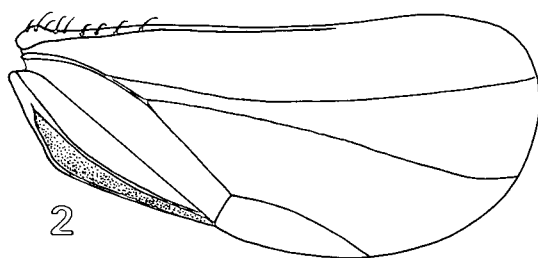
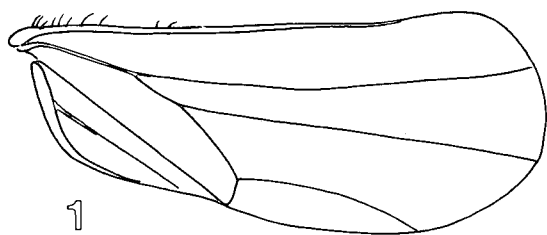


Plate XIII.

Hindwings of psylloids (2).

1. *Acizzia jamatonica* (Kuwayama, 1908)
2. *Cyamophila hexastigma* (Horváth, 1899)
3. *Psylla alni* (Linnaeus, 1758)
4. *Psylla pyrisuga* Foerster, 1848
5. *Psylla mali* (Schmidberger, 1836)
6. *Psylla peninsularis* Kwon sp. nov.
7. *Psylla peninsularis hanlasanensis* Kwon sp. et ssp. nov.
8. *Psylla fulguralis* Kuwayama, 1908
9. *Psylla elaeagni* Kuwayama, 1908
10. *Psylla hanlaböri* Kwon sp. nov.
11. *Psylla elaeagnicola* Miyatake, 1963 (from Mt. Hanlasan).
12. *Psylla elaeagnicola* Miyatake, 1963 (from Mt. Hanlasan).

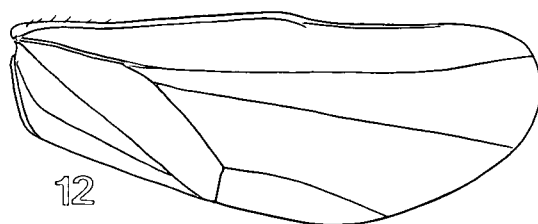
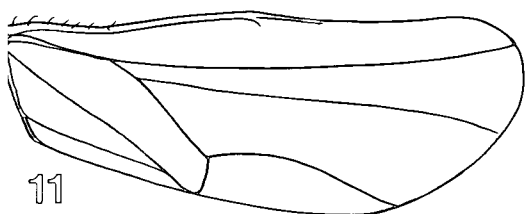
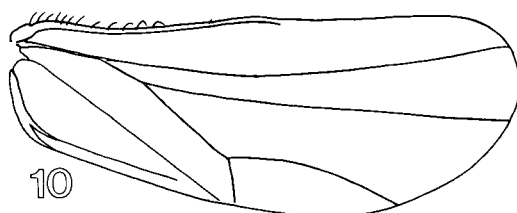
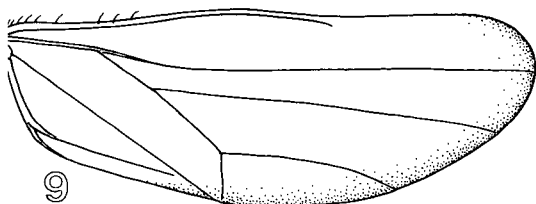
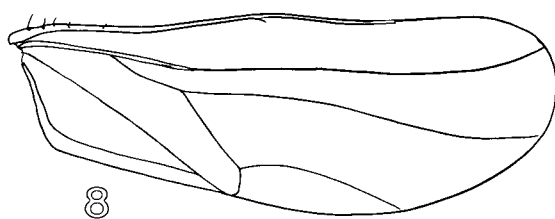
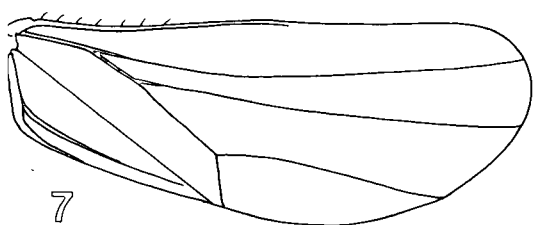
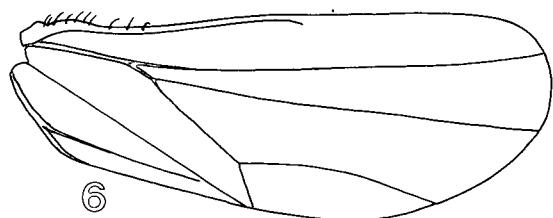
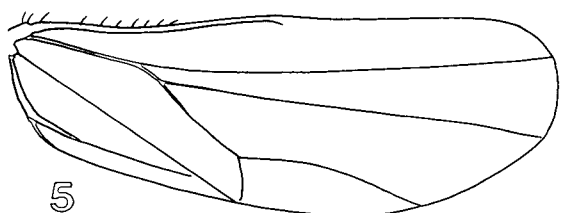
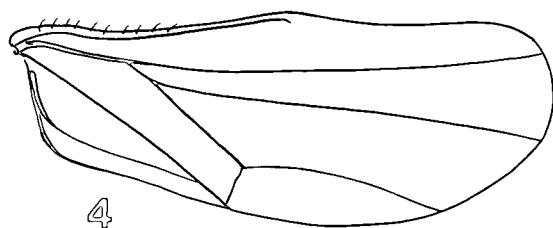
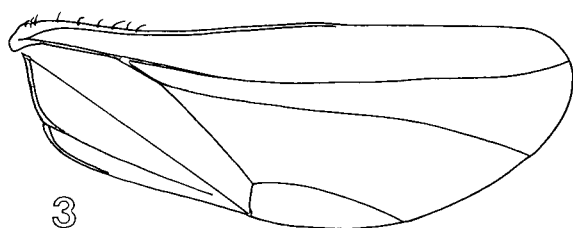
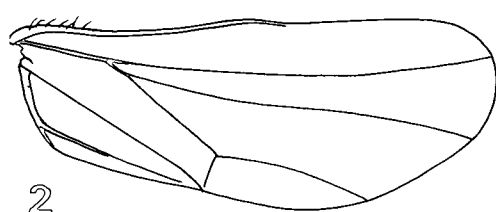
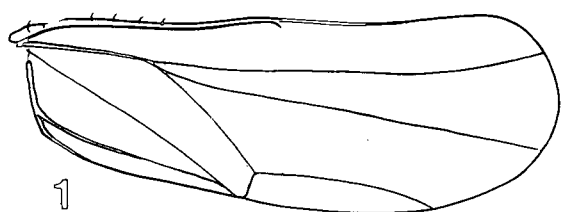




Plate XIV.

Hindwings of psylloids (3).

1. *Psylla elaeagnicola* Miyatake, 1963 (from Samnam Myeon).
2. *Psylla elaeagnicola* Miyatake, 1963 (from Mt. Palgongsan).
3. *Psylla palgongsana* Kwon sp. nov.
4. *Psylla pseudoviburni* Kwon sp. nov.
5. *Psylla juwangsana* Kwon sp. nov.
6. *Psylla fatsiae* Jensen, 1957
7. *Psylla seungmoi* Kwon sp. nov.
8. *Psylla seonhyeongae* Kwon sp. nov.
9. *Psylla silvestris* Kwon sp. nov.
10. *Psylla ambigua* Foerster, 1848
11. *Psylla tobirae* Miyatake, 1964
12. *Psylla rhododendri* Puton, 1871

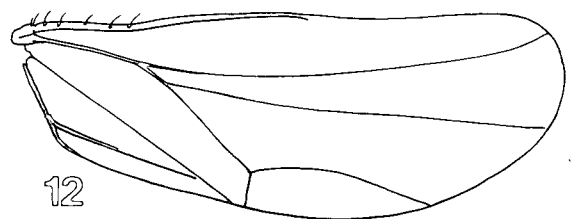
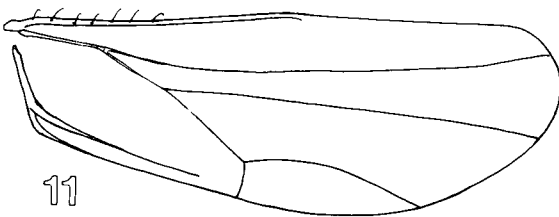
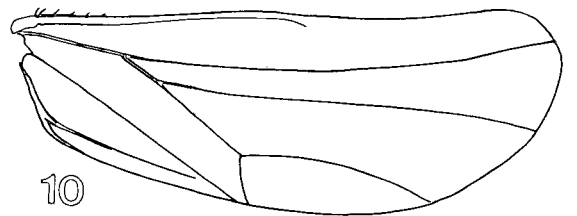
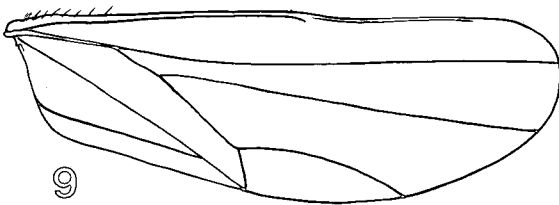
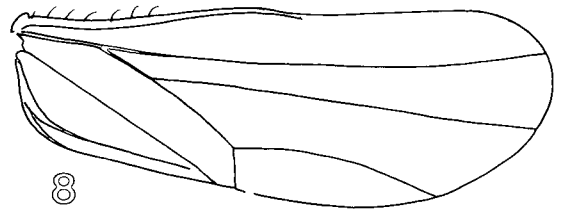
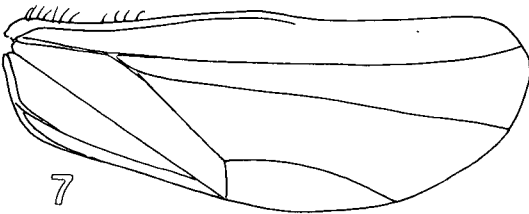
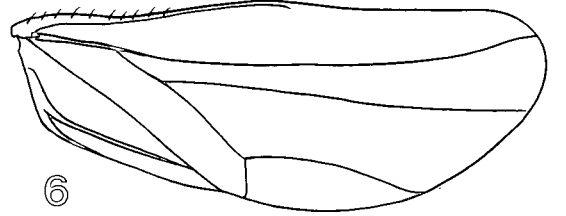
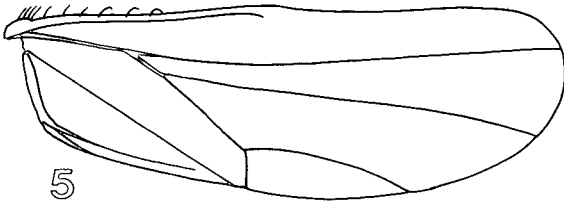
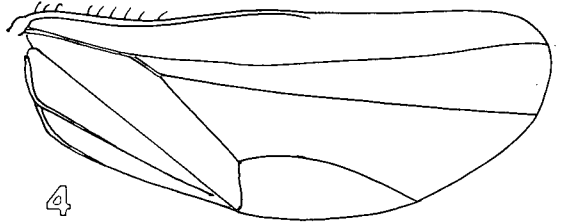
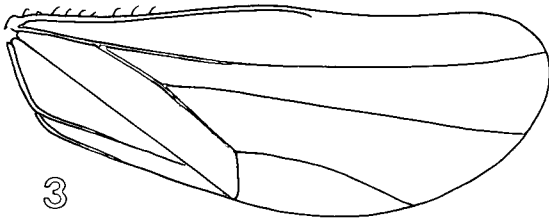
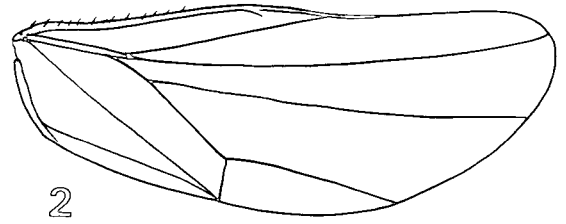
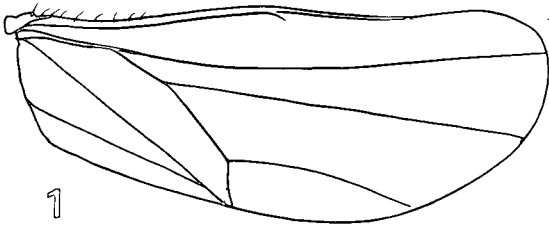


Plate XV.

Hindwings of psylloids (4).

1. *Psylla seolagsana* Kwon sp. nov.
2. *Psylla koreacola* Kwon sp. nov.
3. *Psylla coccinea* Kuwayama, 1908
4. *Psylla quelparticola* Kwon sp. nov.
5. *Psylla ulleungensis* Kwon sp. nov.
6. *Psylla bibari* Kwon sp. nov.
7. *Psylla pyricola* Foerster, 1848
8. *Psylla jukyungi* Kwon sp. nov.
9. *Psylla hederæ* Miyatake, 1964
10. *Psylla lineaticeps* Kwon sp. nov.
11. *Psylla abieti* Kuwayama, 1908
12. *Psylla truncaticephala* Kwon sp. nov.

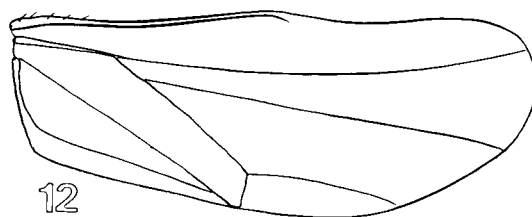
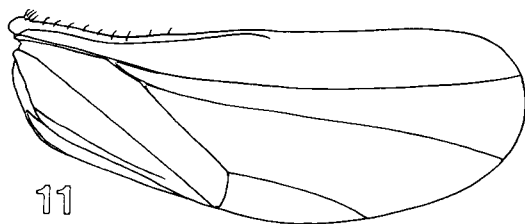
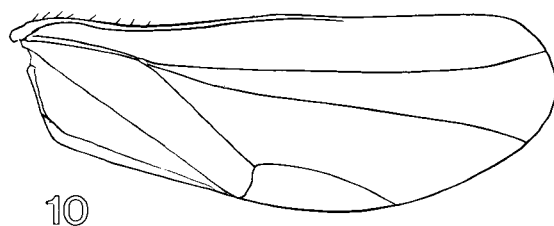
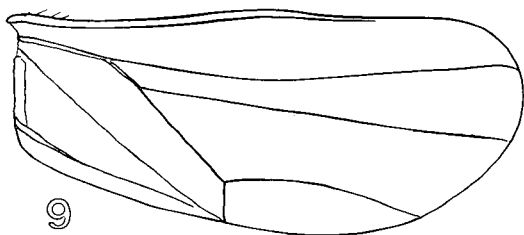
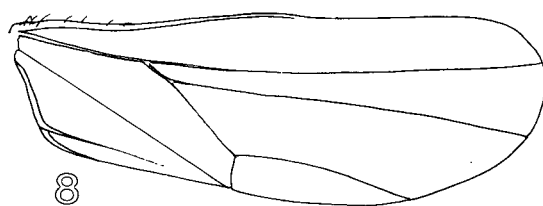
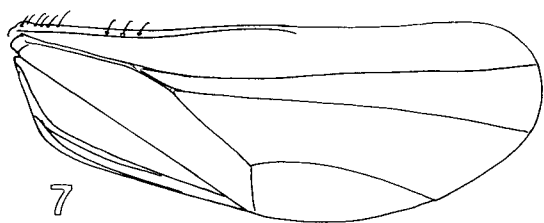
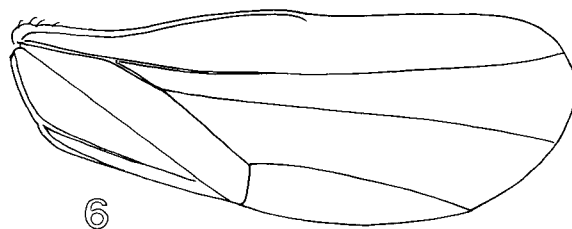
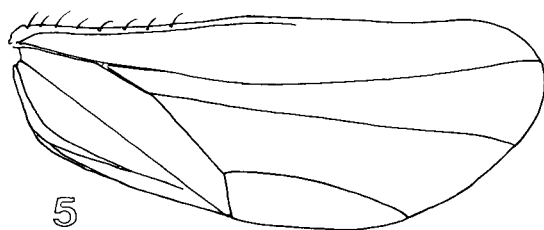
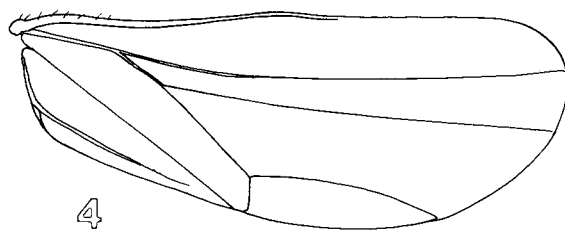
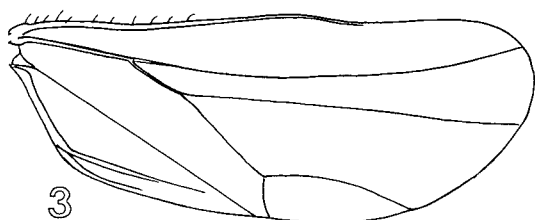
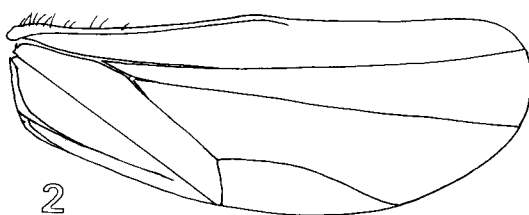
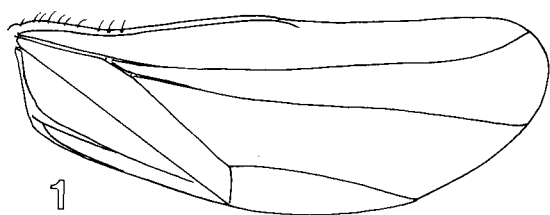
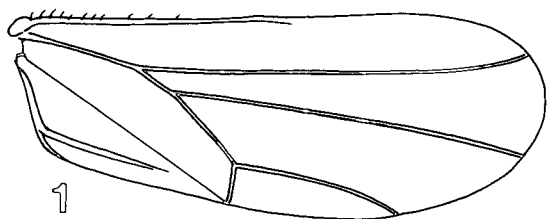


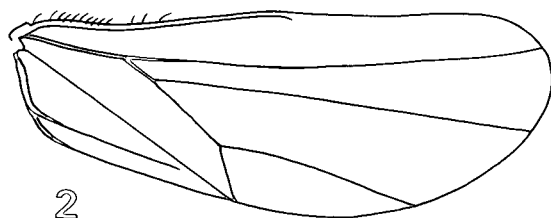
Plate XVI.

Hindwings of psylloids (5).

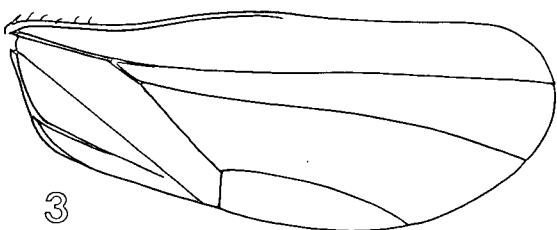
1. *Psylla obongsana* Kwon sp. nov.
2. *Psylla kwonnabiae* Kwon sp. nov.
3. *Psylla sangjaei* Kwon sp. nov.
4. *Psylla nopeunsanicola* Kwon sp. nov.
5. *Psylla subcoccinea* Kwon sp. nov.
6. *Pachypsylla japonica* Miyatake, 1968
7. *Calophya verticornis* Kwon sp. nov.
8. *Calophya shinjii* Sasaki, 1954 (from Mt. Palgongsan).
9. *Calophya shinjii* Sasaki, 1954 (from Is. Ulleungdo).
10. *Epitrioza mizuhonica* Kuwayama, 1910
11. *Epitrioza yasumatsui* Miyatake, 1978
12. *Trichohermes grandis* Loginova, 1965



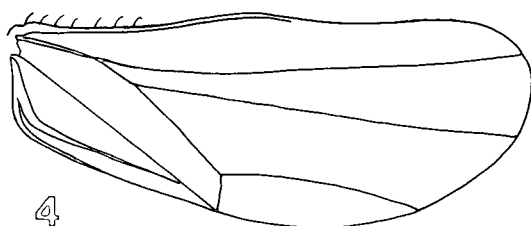
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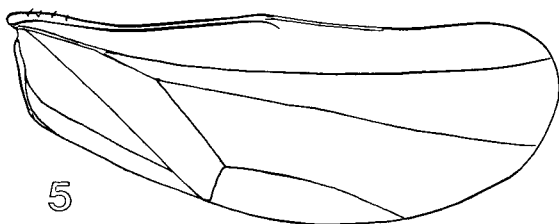
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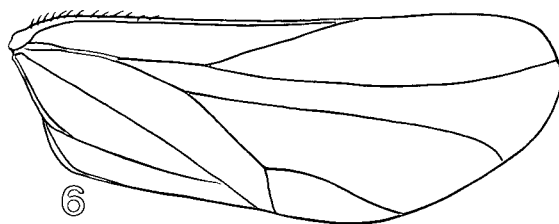
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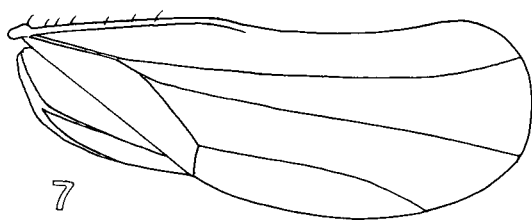
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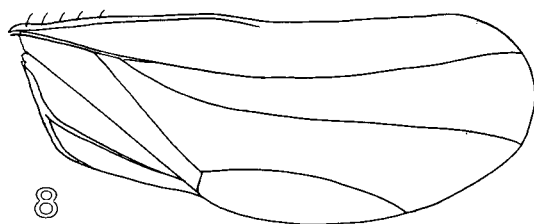
5



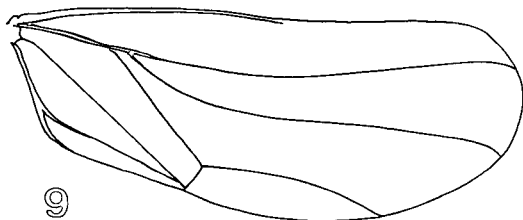
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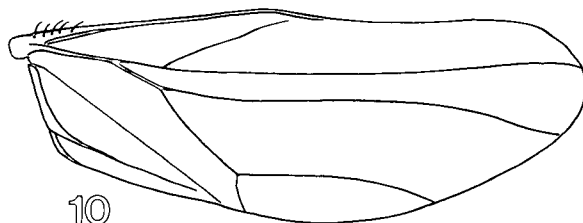
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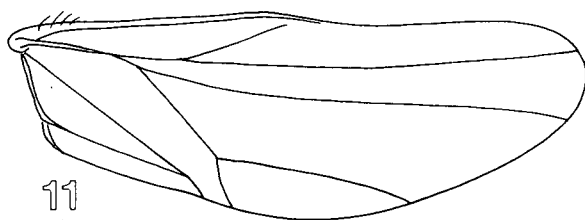
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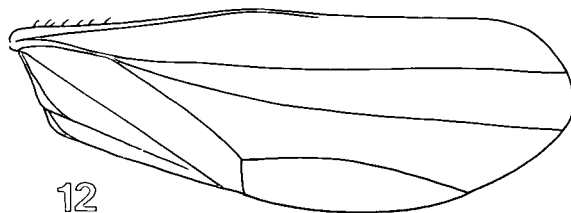
9



10



11



12

Plate XVII.

Hindwings of psylloids (6).

1. *Bactericera distinctissima* Kwon et Lee, 1981
2. *Bactericera calcarata* (Schaefer, 1949)
3. *Bactericera miyatakei* Kwon et Lee, 1981
4. *Bactericera koreostriola* Kwon sp. nov.
5. *Bactericera nobilis* Kwon sp. nov.
6. *Bactericera yamagishii* Kwon et Lee, 1981
7. *Heterotrioza obliqua* (Thomson, 1877)
8. *Heterotrioza chilgia* (Park et Lee, 1980)
9. *Heterotrioza noknamui* Kwon et Lee, 1981
10. *Trioza abdominalis* Flor, 1861 (from Mt. Jirisan).
11. *Trioza abdominalis* Flor, 1861 (from Mt. Hanlasan).
12. *Trioza nigra* Kuwayama, 1910

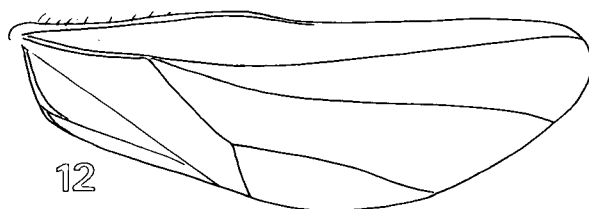
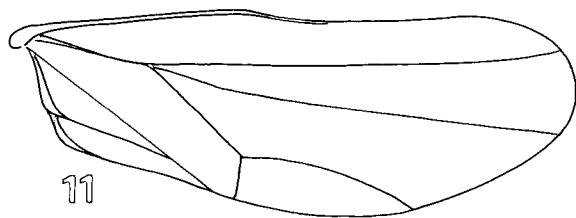
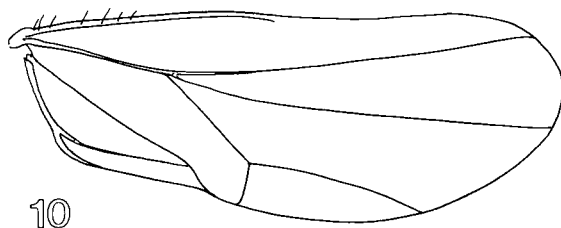
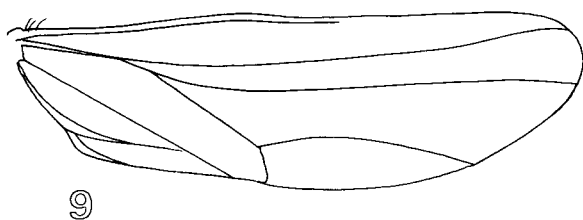
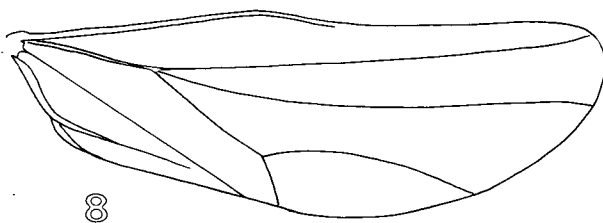
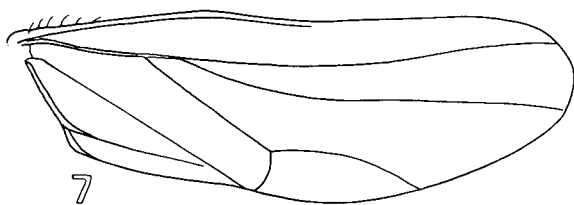
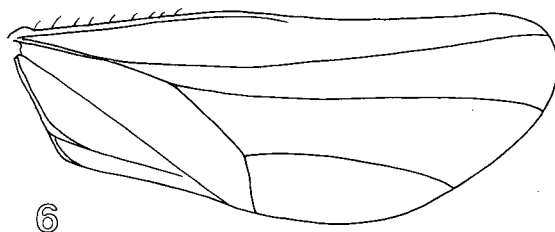
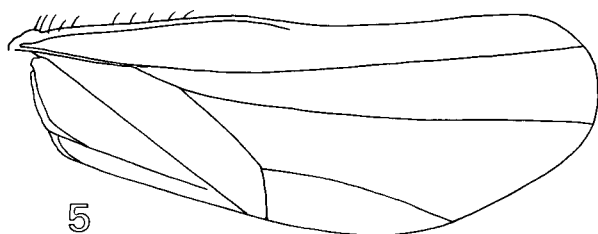
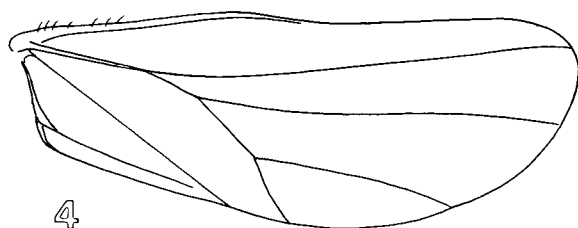
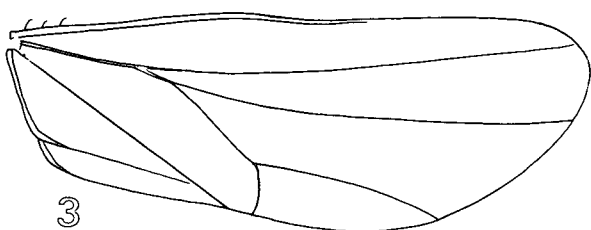
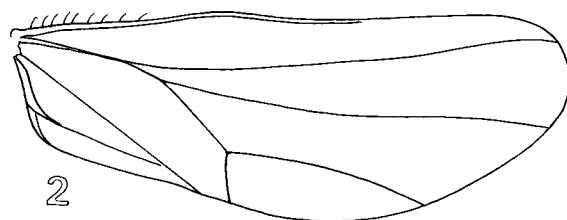
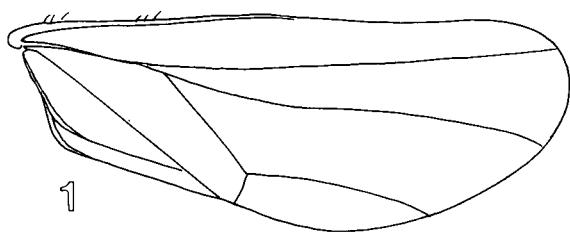




Plate XVIII.

Female genitalia of psylloids in lateral view (1).

1. *Livia jesoensis* Matsumura, 1908
2. *Syringilla humerosa* (Loginova, 1967)
3. *Koreaphalara koreana* Kwon gen. et sp. nov.
4. *Aphalara polygoni* Foerster, 1848
5. *Aphalara itadori* (Shinji, 1938)
6. *Aphalara jungsukae* Kwon sp. nov.
7. *Aphalara fasciata* Kuwayama, 1908
8. *Craspedolepta flava* (Kuwayama, 1908)
9. *Craspedolepta conspersa* (Loew, 1888)
10. *Euphalerus robinae* (Shinji, 1938)
11. *Acizzia jamatonica* (Kuwayama, 1908)
12. *Psylla alni* (Linnaeus, 1758)
13. *Anomoneura mori* Schwarz, 1896
14. *Acizzia sasakii* (Miyatake, 1963)
15. *Cyamophila hexastigma* (Horváth, 1899)

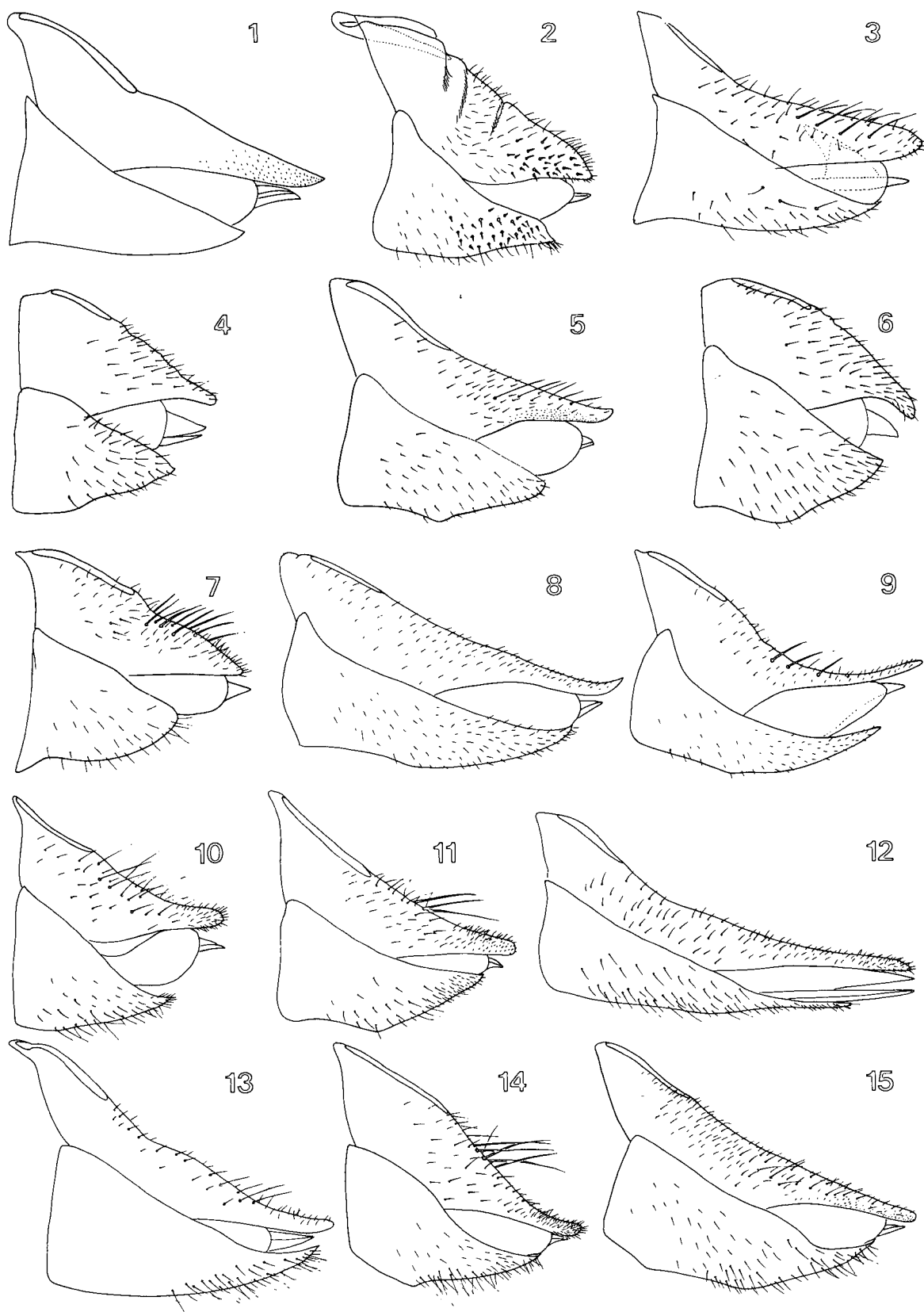


Plate XIX.

Female genitalia of psylloids in lateral view (2).

1. *Psylla pyrisuga* Foerster, 1848
2. *Psylla mali* (Schmidberger, 1836)
3. *Psylla peninsularis* Kwon sp. nov.
4. *Psylla peninsularis hanlasanensis* Kwon sp. et ssp. nov.
5. *Psylla fulguralis* Kuwayama, 1908
6. *Psylla elaeagni* Kuwayama, 1908
7. *Psylla hanlabori* Kwon sp. nov.
8. *Psylla elaeagnicola* Miyatake, 1963
9. *Psylla silvestris* Kwon sp. nov.
10. *Psylla pseudoviburni* Kwon sp. nov.
11. *Psylla seungmoi* Kwon sp. nov.
12. *Psylla fatsiae* Jensen, 1957
13. *Psylla seonhyeongae* Kwon sp. nov.
14. *Psylla juwangsana* Kwon sp. nov.
15. *Psylla ambigua* Foerster, 1848

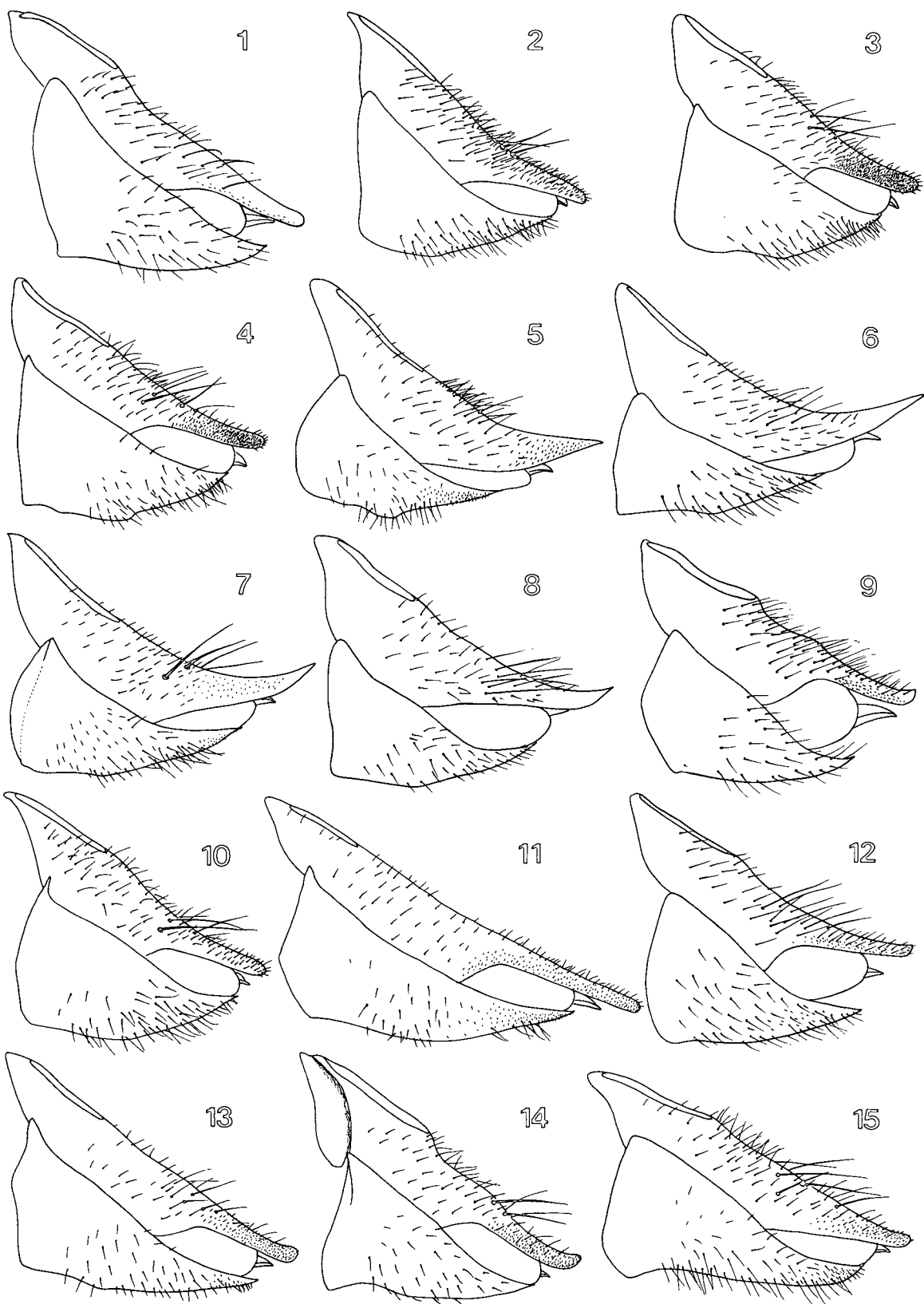


Plate XX.

Female genitalia of psylloids in lateral view (3).

1. *Psylla tobirae* Miyatake, 1964
2. *Psylla rhododendri* Puton, 1871
3. *Psylla seolagsana* Kwon sp. nov.
4. *Psylla koreacola* Kwon sp. nov.
5. *Psylla coccinea* Kuwayama, 1908
6. *Psylla ulleungensis* Kwon sp. nov.
7. *Psylla pyricola* Foerster, 1848
8. *Psylla jukyungi* Kwon sp. nov.
9. *Psylla hederæ* Miyatake, 1964
10. *Psylla lineaticeps* Kwon sp. nov.
11. *Psylla abietis* Kuwayama, 1908
12. *Psylla kwonnabiae* Kwon sp. nov.
13. *Psylla obongsana* Kwon sp. nov.
14. *Psylla nopeunsanicola* Kwon sp. nov.
15. *Psylla subcoccinea* Kwon sp. nov.

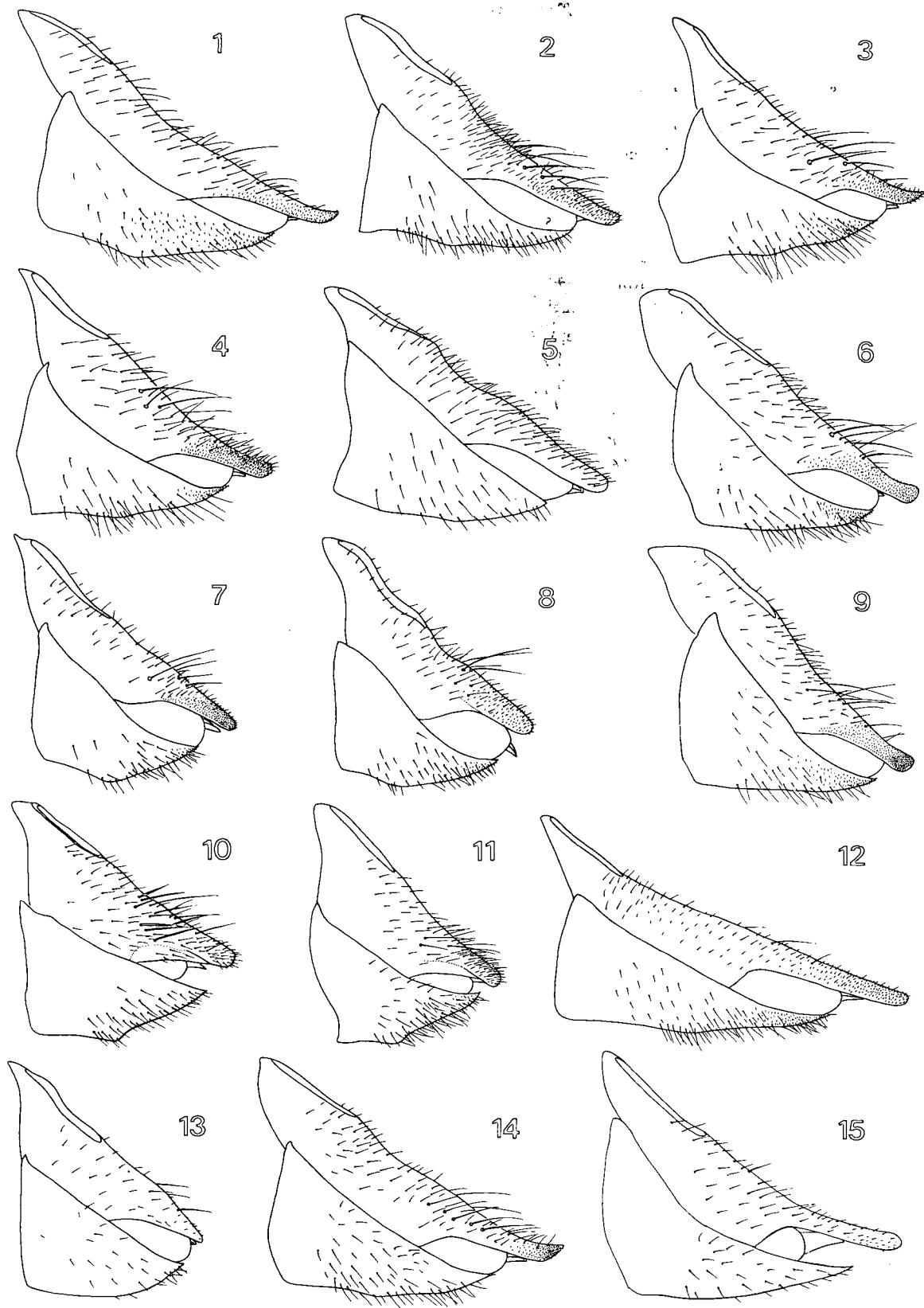


Plate XXI.

Female genitalia of psylloids in lateral view (4).

1. *Pachypsylla japonica* Miyatake, 1968
2. *Calophya verticornis* Kwon sp. nov.
3. *Epitrioza mizuhonica* Kuwayama, 1910
4. *Epitrioza yasumastui* Miyatake, 1978
5. *Trichohermes grandis* Loginova, 1965
6. *Bactericera distinctissima* Kwon et Lee, 1981
7. *Bactericera myohyangi* (Klimaszewski, 1968)
8. *Bactericera calcarata* (Schaefer, 1949)
9. *Bactericera miyatakei* Kwon et Lee, 1981
10. *Bactericera koreostriola* Kwon sp. nov.
11. *Bactericera yamagishii* Kwon et Lee, 1981
12. *Heterotrioza obliqua* (Thomson, 1877)
13. *Heterotrioza noknamui* Kwon et Lee, 1981
14. *Trioza abdominalis* Flor, 1861
15. *Trioza nigra* Kuwayama, 1910

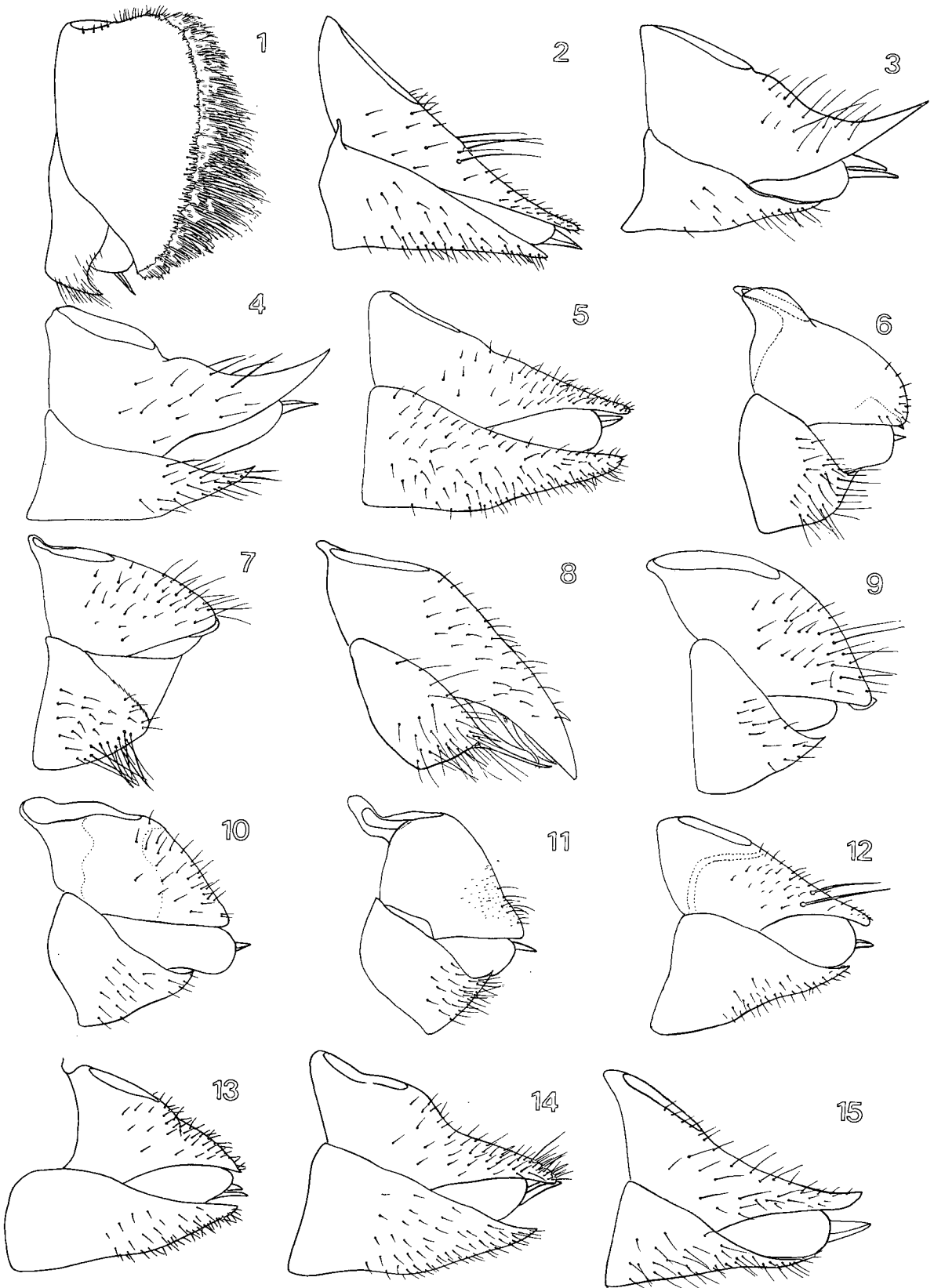




Plate XXII.

Male genitalia of psylloids in lateral view (1)

1. *Livia jesoensis* Matsumura, 1908
2. *Syringilla humerosa* (Loginova, 1967)
3. *Koreaphalara koreana* Kwon gen. et sp. nov.
4. *Aphalara polygoni* Foerster, 1848
5. *Aphalara itadori* (Shinji, 1938)
6. *Aphalara jungsukae* Kwon sp. nov.
7. *Aphalara fasciata* Kuwayama, 1908
8. *Craspedolepta conspersa* (Loew, 1888)
9. *Anomoneura mori* Schwarz, 1896
10. *Euphalerus robinae* (Shinji, 1938)
11. *Acizzia sasaki* (Miyatake, 1963)
12. *Acizzia jamatonica* (Kuwayama, 1908)

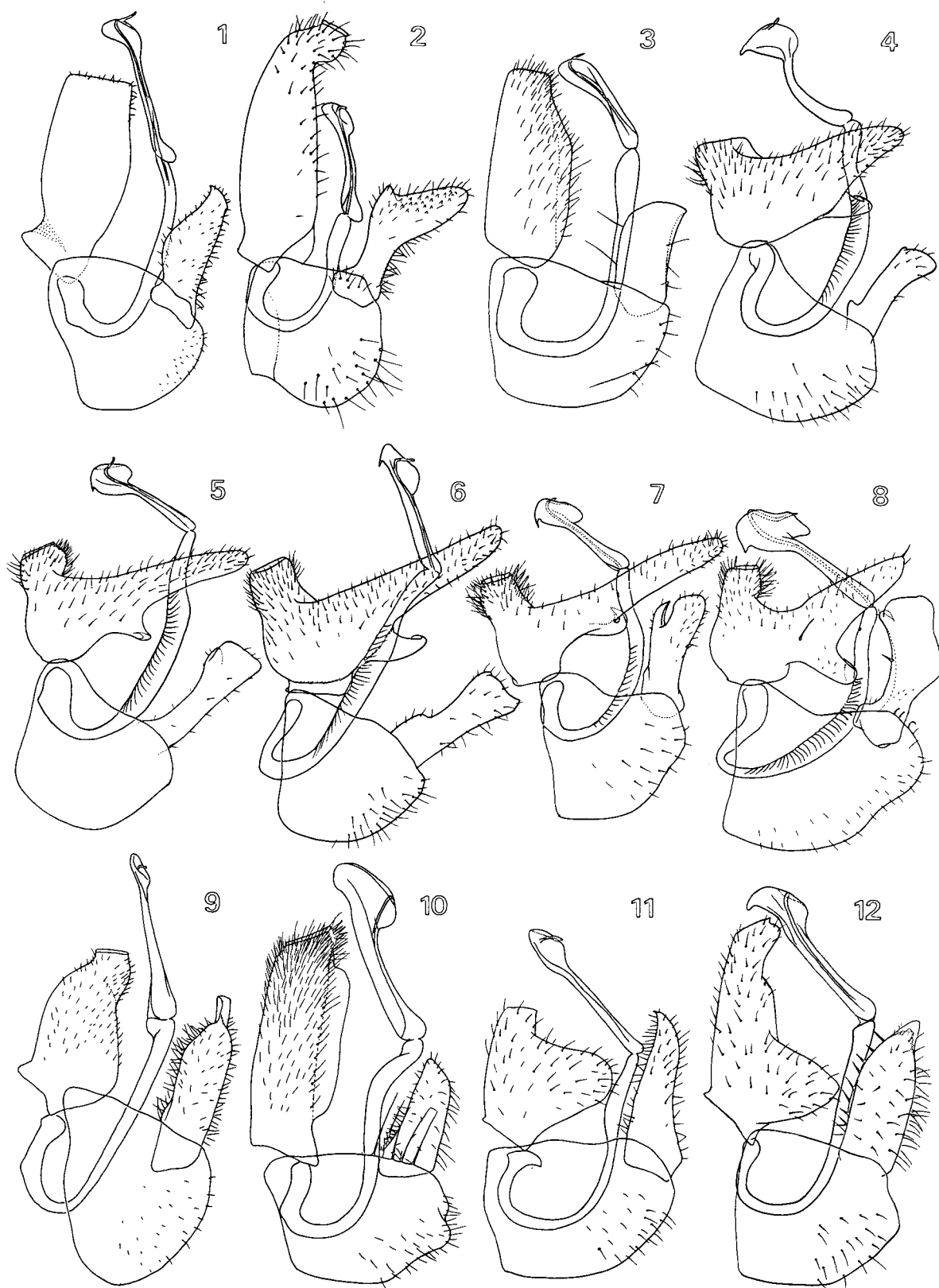


Plate XXIII.

Male genitalia of psylloids in lateral view (2).

1. *Cyamophila hexastigma* (Horváth, 1899)
2. *Psylla alni* (Linnaeus, 1758)
3. *Psylla pyrisuga* Foerster, 1848
4. *Psylla mali* (Schmidberger, 1836)
5. *Psylla peninsularis* Kwon sp. nov.
6. *Psylla peninsularis hanlasanensis* Kwon sp. et ssp. nov.
7. *Psylla fulguralis* Kuwayama, 1908
8. *Psylla elaeagni* Kuwayama, 1908
9. *Psylla elaeagnicola* Miyatake, 1963 (from Mt. Palgongsan).
10. *Psylla elaeagnicola* Miyatake, 1963 (from Mt. Hanlasan).
11. *Psylla elaeagnicola* Miyatake, 1963 (from Samnam Myeon).
12. *Psylla elaeagnicola* Miyatake, 1963 (from Mt. Hanlasan).

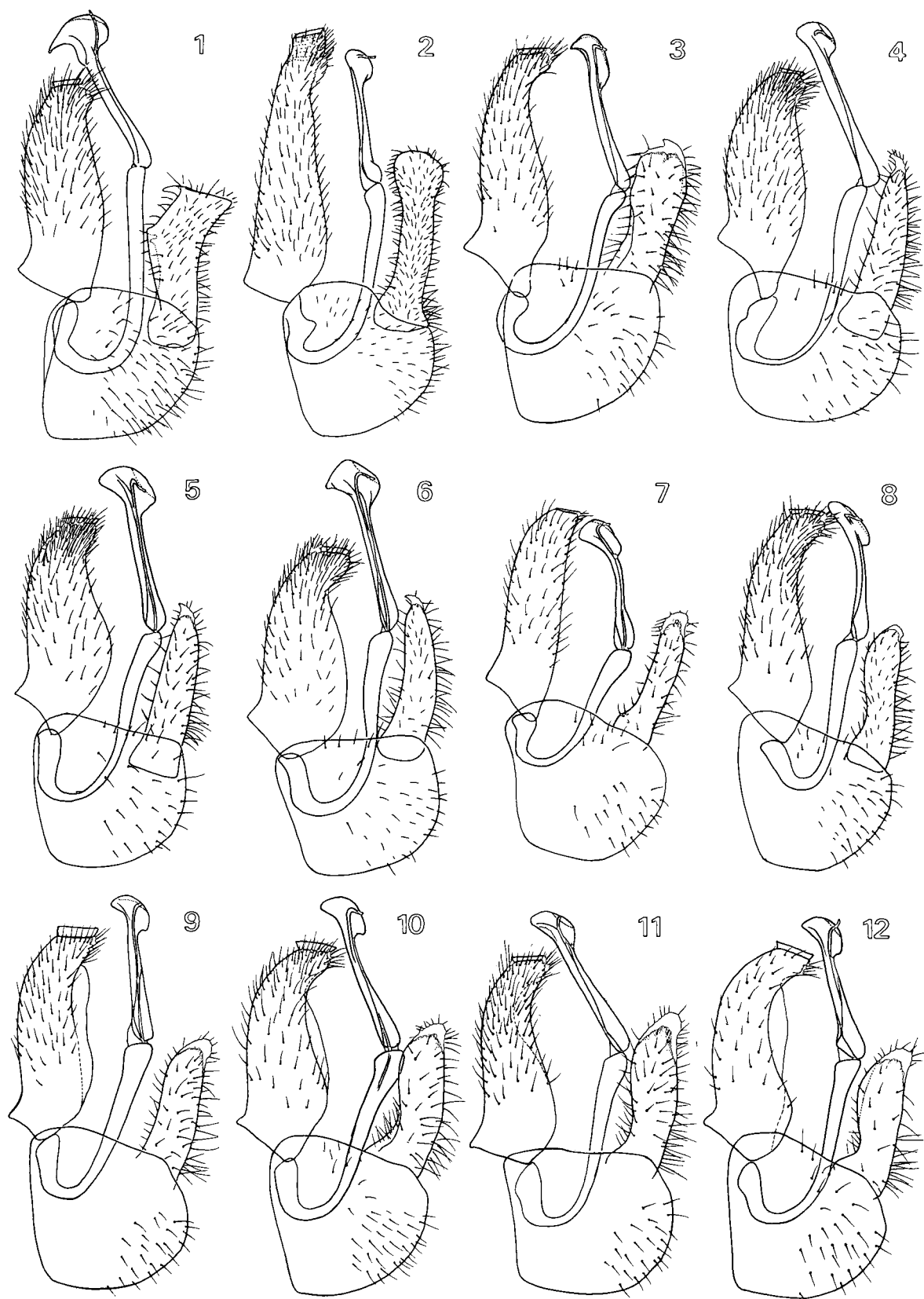


Plate XXIV.

Male genitalia of psylloids in lateral view (3).

1. *Psylla palgongsana* Kwon sp. nov.
2. *Psylla pseudoviburni* Kwon sp. nov.
3. *Psylla juwangsana* Kwon sp. nov.
4. *Psylla fatsiae* Jensen, 1957
5. *Psylla seonhyeongae* Kwon sp. nov.
6. *Psylla silvestris* Kwon sp. nov.
7. *Psylla ambigua* Foerster, 1848
8. *Psylla tobirae* Miyatake, 1964
9. *Psylla rhododendri* Puton, 1871
10. *Psylla seolagsana* Kwon sp. nov.
11. *Psylla koreacola* Kwon sp. nov.
12. *Psylla coccinea* Kuwayama, 1908

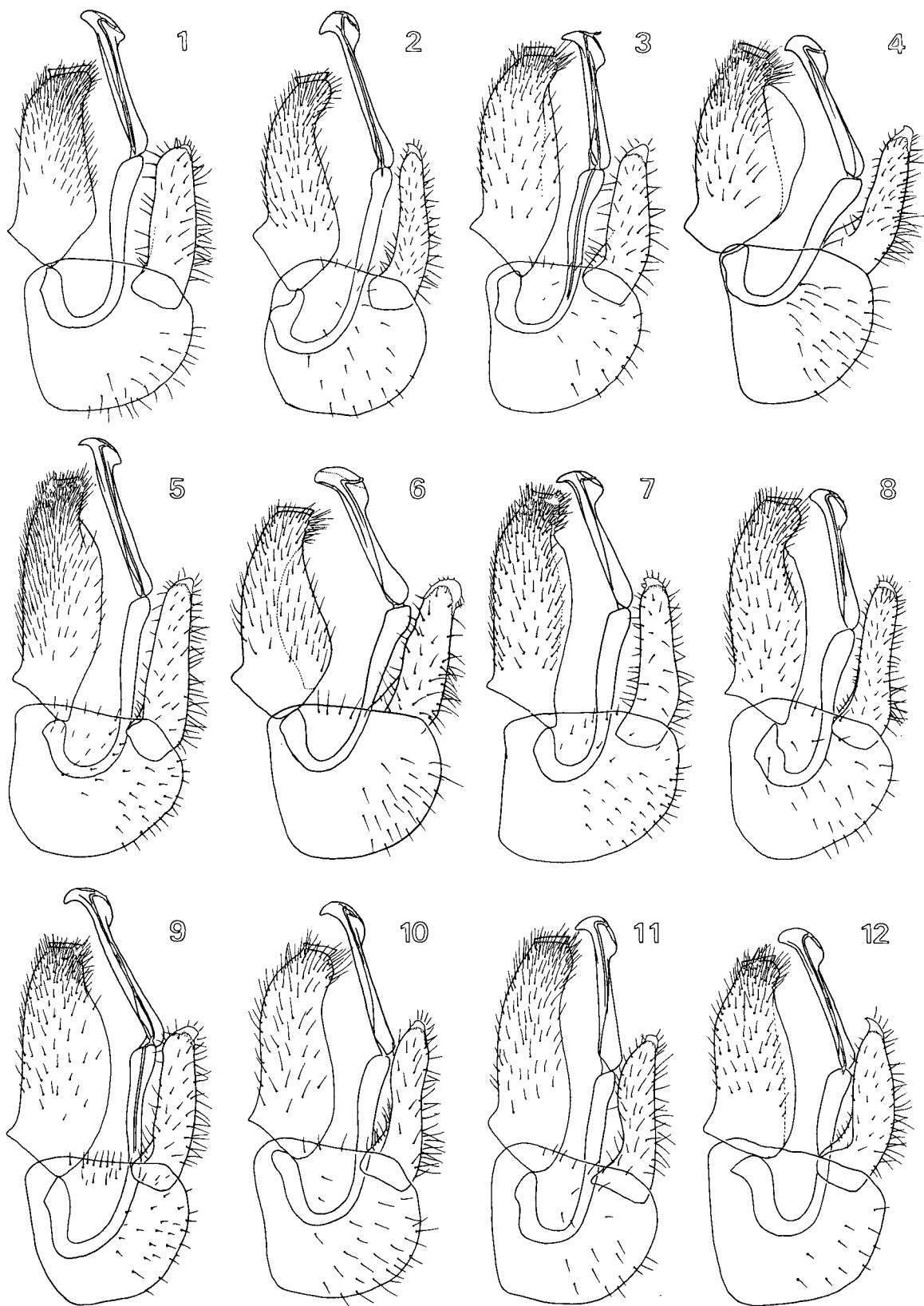


Plate XXV.

Male genitalia of psylloids in lateral view (4).

1. *Psylla quelparticola* Kwon sp. nov.
2. *Psylla ulleungensis* Kwon sp. nov.
3. *Psylla bibari* Kwon sp. nov.
4. *Psylla pyricola* Foerster, 1848
5. *Psylla jukyungi* Kwon sp. nov.
6. *Psylla hederæ* Miyatake, 1964
7. *Psylla lineaticeps* Kwon sp. nov.
8. *Psylla abietis* Kuwayama, 1908
9. *Psylla truncaticephala* Kwon sp. nov.
10. *Psylla obongsana* Kwon sp. nov.
11. *Psylla kwonnabiae* Kwon sp. nov.
12. *Psylla sangjaei* Kwon sp. nov.

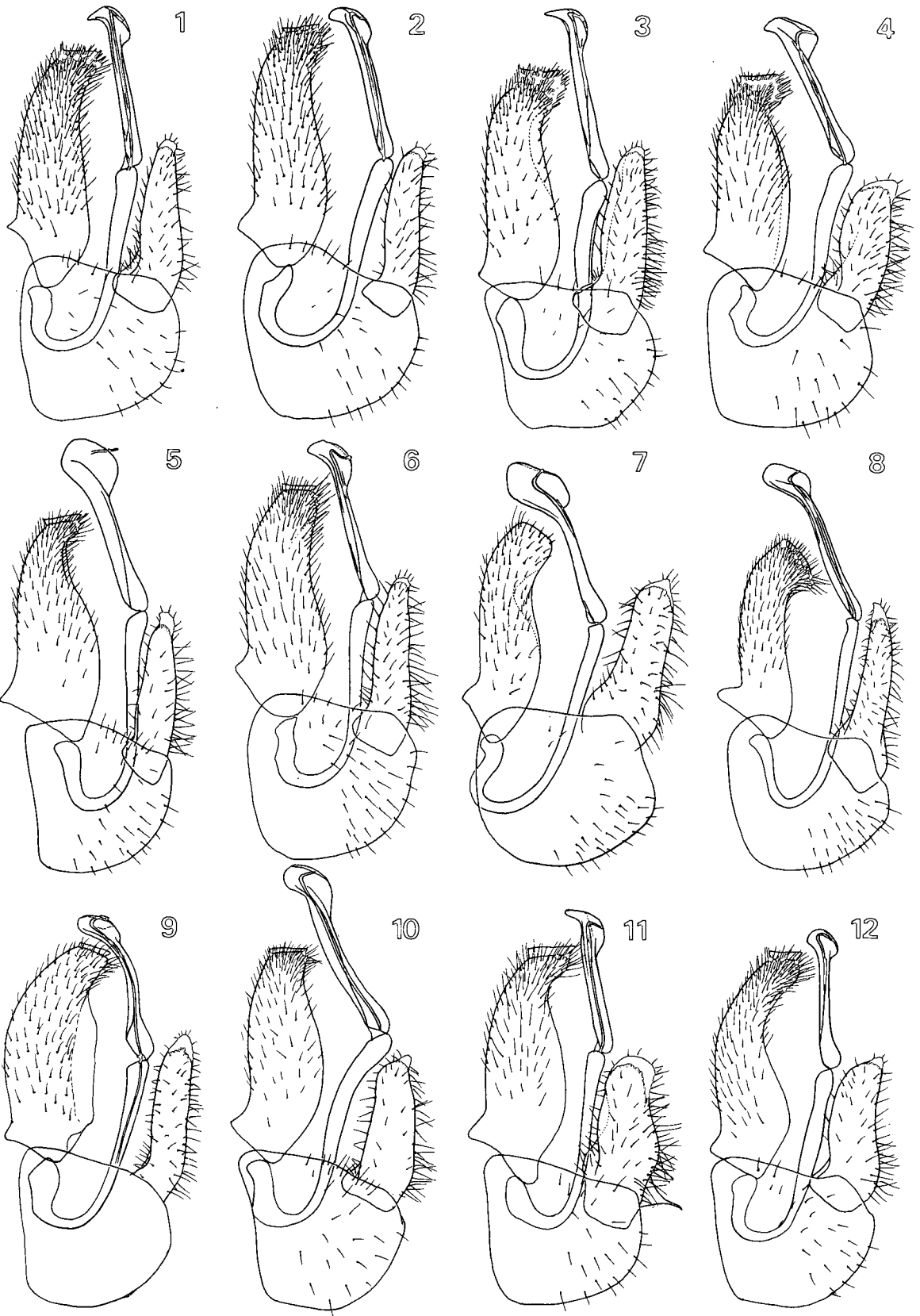
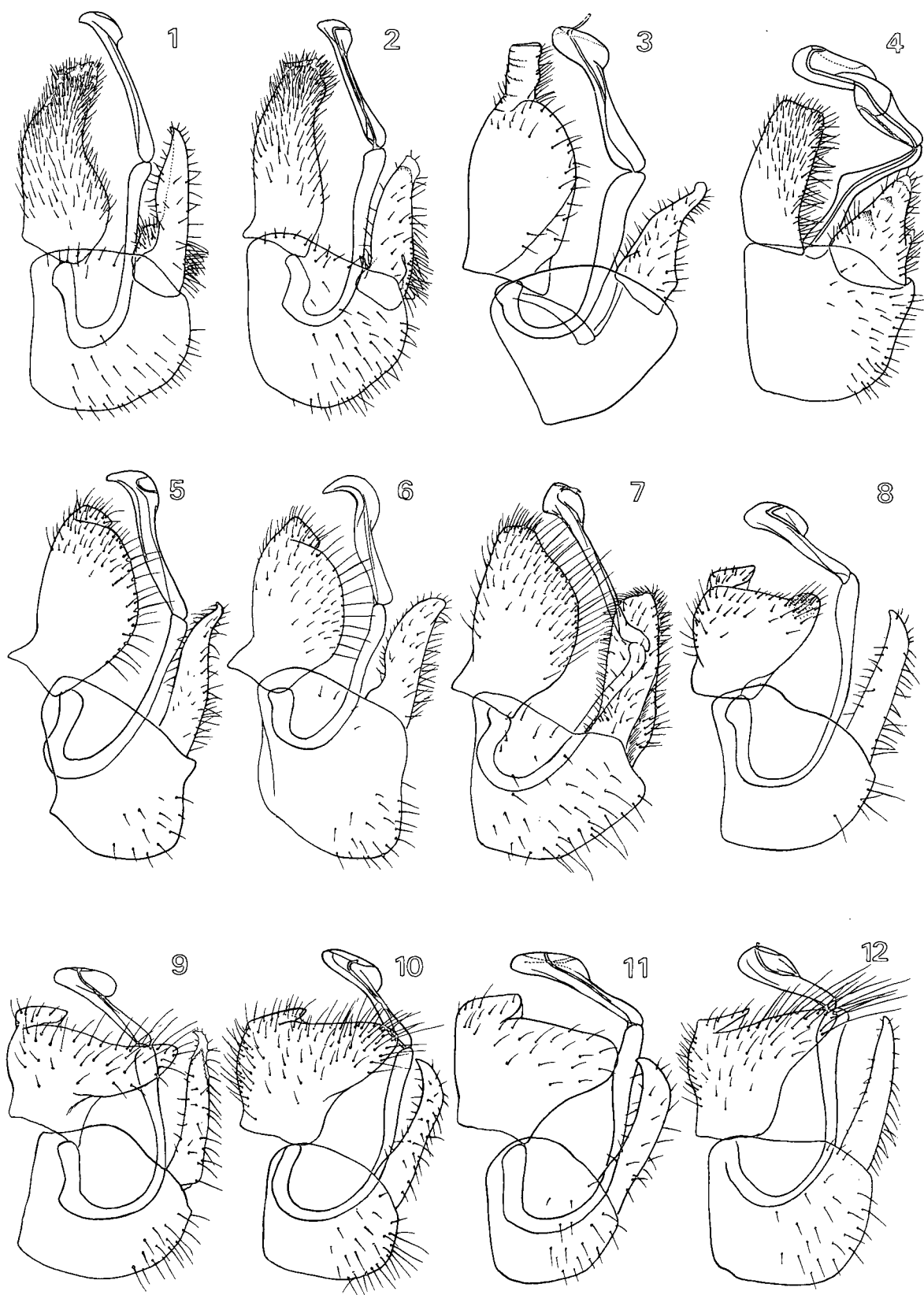




Plate XXVI.

Male genitalia of psylloids in lateral view (5).

1. *Psylla nopeunsanicola* Kwon sp. nov.
2. *Psylla subcoccinea* Kwon sp. nov.
3. *Pachypsylla japonica* Miyatake, 1968
4. *Calophya shinjii* Sasaki, 1954
5. *Epitrioza mizuhonica* Kuwayama, 1910
6. *Epitrioza yasumatsui* Miyatake, 1978
7. *Trichohermes grandis* Loginova, 1965
8. *Bactericera distinctissima* Kwon et Lee, 1981
9. *Bactericera myohyangi* (Klimaszewski, 1968)
10. *Bactericera miyatakei* Kwon et Lee, 1981
11. *Bactericera koreostriola* Kwon sp. nov.
12. *Bactericera yamagishii* Kwon et Lee, 1981



## Plate XXVII.

### Male genitalia of psylloids in lateral view (6).

1. *Heterotrioza obliqua* (Thomson, 1877)
2. *Heterotrioza chilgia* (Park et Lee, 1980)
3. *Heterotrioza noknamui* Kwon et Lee, 1981
4. *Trioza abdominalis* Flor, 1861
5. *Trioza nigra* Kuwayama, 1910

### Tips of parameres in psylloids.

6. *Cyamophila hexastigma* (Horváth, 1899)
7. *Psylla alni* (Linnaeus, 1758)
8. *Psylla pyrisuga* Foerster, 1848
9. *Psylla mali* (Schmidberger, 1836)
10. *Psylla peninsularis* Kwon sp. nov.
11. *Psylla peninsularis hanlasanensis* Kwon sp. et ssp. nov.
12. *Psylla elaeagni* Kuwayama, 1908
13. *Psylla elaeagnicola* Miyatake, 1963 (from Samnam Myeon).
14. *Psylla elaeagnicola* Miyatake, 1963 (from Mt. Hanlasan).
15. *Psylla elaeagnicola* Miyatake, 1963 (from Mt. Palgongsan).
16. *Psylla palgongsana* Kwon sp. nov.
17. *Psylla pseudoviburni* Kwon sp. nov.
18. *Psylla juwangana* Kwon sp. nov.
19. *Psylla fatsiae* Jensen 1957
20. *Psylla seonhyeongae* Kwon sp. nov.
21. *Psylla silvestris* Kwon sp. nov.
22. *Psylla ambigua* Foerster, 1848
23. *Psylla tobirae* Miyatake, 1964
24. *Psylla rhododendri* Puton, 1871
25. *Psylla seolagsana* Kwon sp. nov.
26. *Psylla koreacola* Kwon sp. nov.
27. *Psylla coccinea* Kuwayama, 1908
28. *Psylla quelparticola* Kwon sp. nov.
29. *Psylla ulleungensis* Kwon sp. nov.
30. *Psylla bibari* Kwon sp. nov.
31. *Psylla pyricola* Foerster, 1848
32. *Psylla jukyungi* Kwon sp. nov.
33. *Psylla hederæ* Miyatake, 1964
34. *Psylla lineaticeps* Kwon sp. nov.
35. *Psylla abietis* Kuwayama, 1908
36. *Psylla truncaticephala* Kwon sp. nov.
37. *Psylla obongsana* Kwon sp. nov.
38. *Psylla kwonnabiae* Kwon sp. nov.
39. *Psylla sangjaei* Kwon sp. nov.
40. *Psylla nopeunsanicola* Kwon sp. nov.
41. *Psylla subcoccinea* Kwon sp. nov.

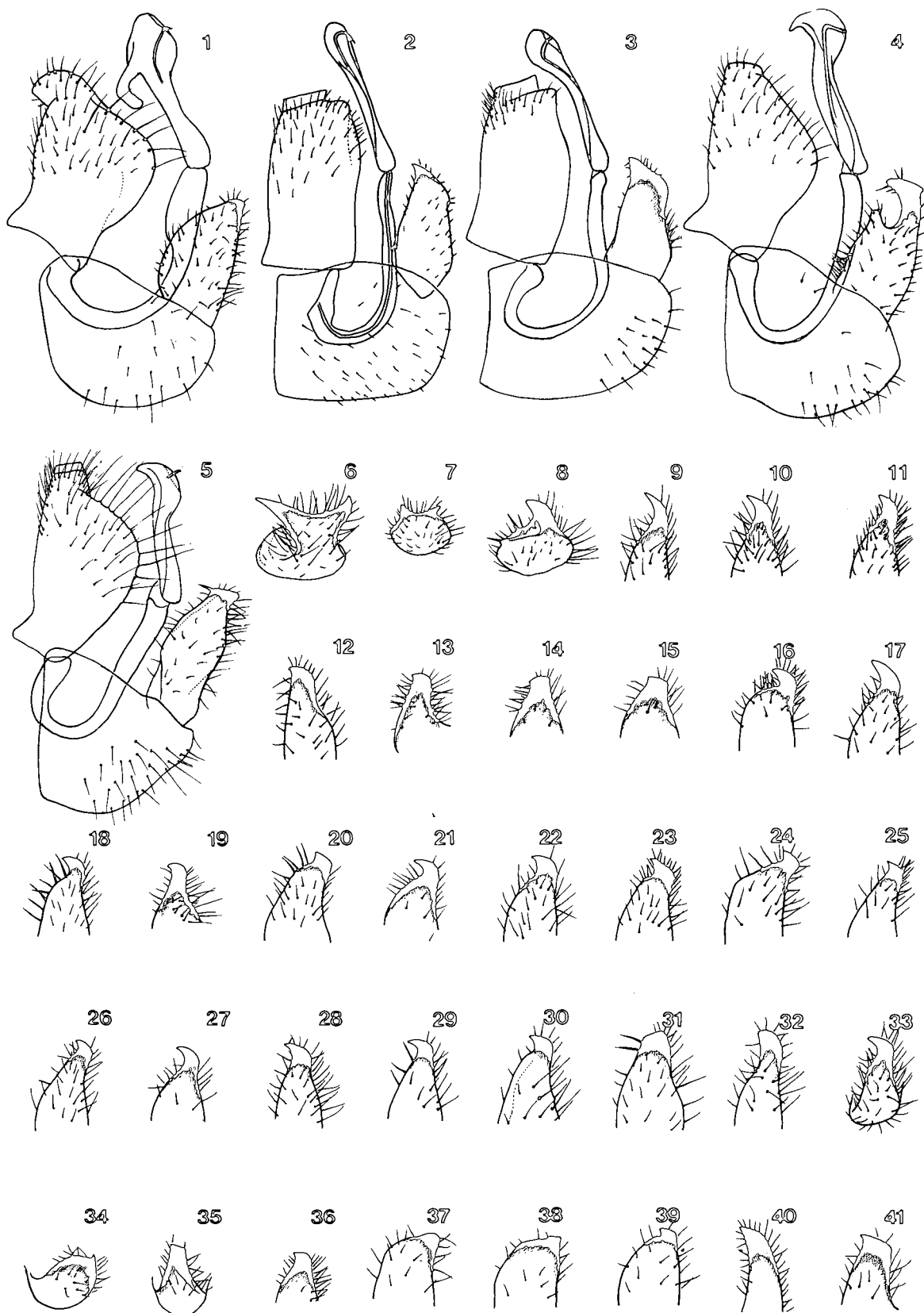


Plate XXVIII.

Parameres of psylloids in lateral view (1).

1. *Livia jesoensis* Matsumura, 1908
2. *Syringilla humerosa* (Loginova, 1967)
3. *Koreaphalara koreana* Kwon gen. et sp. nov.
4. *Aphalara polygona* Foerster, 1848
5. *Aphalara itadori* (Shinji, 1938)
6. *Aphalara jungsukae* Kwon sp. nov.
7. *Aphalara fasciata* Kuwayama, 1908
8. *Craspedolepta conspersa* (Loew, 1888)
9. *Anomoneura mori* Schwarz, 1896
10. *Euphalerus robiniae* (Shinji, 1938)
11. *Acizzia sasakii* (Miyatake, 1963)
12. *Acizzia jamatonica* (Kuwayama, 1908)
13. *Cyamophila hexastigma* (Horváth, 1899)
14. *Psylla alni* (Linnaeus, 1758)
15. *Psylla pyrisuga* Foerster, 1848
16. *Psylla mali* (Schmidberger, 1836)
17. *Psylla peninsularis* Kwon sp. nov.
18. *Psylla peninsularis hanlasanensis* Kwon sp. et ssp. nov.
19. *Psylla fulguratis* Kuwayama, 1908
20. *Psylla elaeagni* Kuwayama, 1908
21. *Psylla elaeagnicola* Miyatake, 1963 (from Samnam Myeon).
22. *Psylla elaeagnicola* Miyatake, 1963 (from Mt. Hanlasan).
23. *Psylla elaeagnicola* Miyatake, 1963 (from Mt. Hanlasan).
24. *Psylla palgongsana* Kwon sp. nov.
25. *Psylla pseudoviburni* Kwon sp. nov.
26. *Psylla juwangsana* Kwon sp. nov.
27. *Psylla fatsiae* Jensen, 1957
28. *Psylla seonhyeongae* Kwon sp. nov.
29. *Psylla silvestris* Kwon sp. nov.
30. *Psylla ambigua* Foerster, 1848
31. *Psylla tobirae* Miyatake, 1964
32. *Psylla rhododendri* Puton, 1871

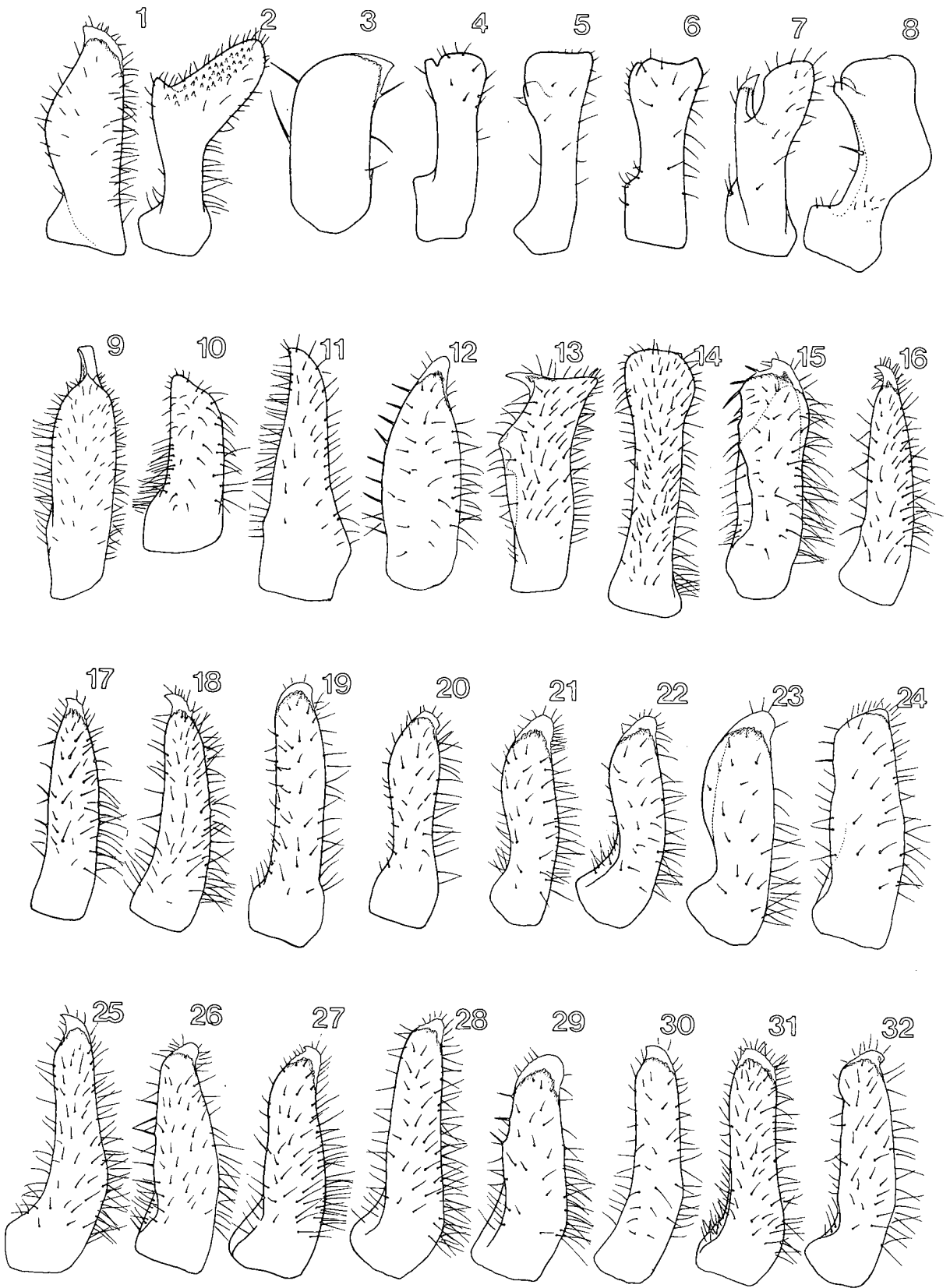


Plate XXIX.

Parameres of psylloids in lateral view (2).

1. *Psylla seolagsana* Kwon sp. nov.
2. *Psylla koreacola* Kwon sp. nov.
3. *Psylla coccinea* Kuwayama, 1908
4. *Psylla quelparticola* Kwon sp. nov.
5. *Psylla ulleungensis* Kwon sp. nov.
6. *Psylla bibari* Kwon sp. nov.
7. *Psylla pyricola* Foerster, 1848
8. *Psylla jukyungi* Kwon sp. nov.
9. *Psylla hederæ* Miyatake, 1964
10. *Psylla lineaticeps* Kwon sp. nov.
11. *Psylla abietis* Kuwayama, 1908
12. *Psylla truncaticephala* Kwon sp. nov.
13. *Psylla obongsana* Kwon sp. nov.
14. *Psylla kwonnabiae* Kwon sp. nov.
15. *Psylla sangjaei* Kwon sp. nov.
16. *Psylla nopeunsanicola* Kwon sp. nov.
17. *Psylla subcoccinea* Kwon sp. nov.
18. *Pachypsylla japonica* Miyatake, 1968
19. *Calophya shinjii* Sasaki, 1954
20. *Epitrioza mizuhonica* Kuwayama, 1910
21. *Epitrioza yasumatsui* Miyatake, 1968
22. *Trichohermes grandis* Loginova, 1965
23. *Bactericera distinctissima* Kwon et Lee, 1981
24. *Bactericera myohyangi* (Klimaszewski, 1968)
25. *Bactericera miyatakei* Kwon et Lee, 1981
26. *Bactericera koreostriola* Kwon sp. nov.
27. *Bactericera yamagishii* Kwon et Lee, 1981
28. *Heterotrioza obliqua* (Thomson, 1877)
29. *Heterotrioza chilgia* (park et Lee, 1980)
30. *Heterotrioza noknamui* Kwon et Lee, 1981
31. *Trioza abdominalis* Flor, 1861
32. *Trioza nigra* Kuwayama, 1910

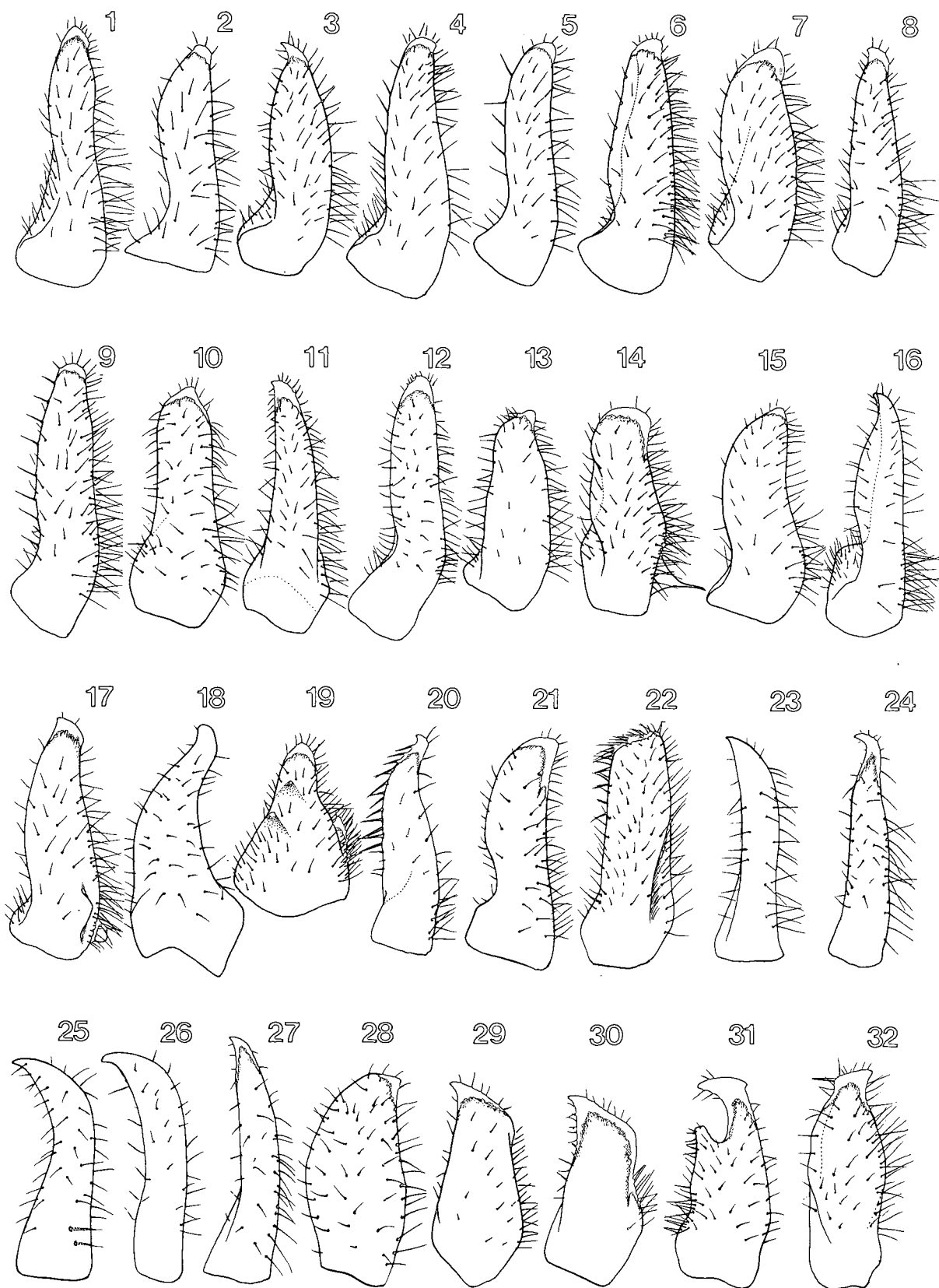




Plate XXX.

Parameres of psylloids in caudal view (1).

1. *Koreaphalara koreana* Kwon gen. et sp. nov.
2. *Acizzia jamatonica* (Kuwayama, 1908)
3. *Cyamophila hexastigma* (Horváth, 1899)
4. *Psylla pyrisuga* Foerster, 1848
5. *Psylla mali* (Schmidberger, 1836)
6. *Psylla peninsularis* Kwon sp. nov.
7. *Psylla peninsularis hanlasanensis* Kwon sp. nov.
8. *Psylla fulguralis* Kuwayama, 1908
9. *Psylla elaeagni* Kuwayama, 1908
10. *Psylla elaeagnicola* Miyatake, 1963
11. *Psylla palgongsana* Kwon sp. nov.
12. *Psylla pseudoviburni* Kwon sp. nov.
13. *Psylla juwangsana* Kwon sp. nov.
14. *Psylla fatsiae* Jensen, 1957
15. *Psylla seonhyeongae* Kwon sp. nov.
16. *Psylla silvestris* Kwon sp. nov.
17. *Psylla ambigua* Foerster, 1848.
18. *Psylla tobirae* Miyatake, 1964
19. *Psylla rhododendri* Puton, 1871
20. *Psylla seolagsana* Kwon sp. nov.
21. *Psylla koreacola* Kwon sp. nov.
22. *Psylla coccinea* Kuwayama, 1908
23. *Psylla quelparticola* Kwon sp. nov.
24. *Psylla ulleungensis* Kwon sp. nov.
25. *Psylla bibari* Kwon sp. nov.
26. *Psylla pyricola* Foerster, 1848
27. *Psylla jukyungi* Kwon sp. nov.
28. *Psylla hederæ* Miyatake, 1964
29. *Psylla lineaticeps* Kwon sp. nov.
30. *Psylla obongsana* Kwon sp. nov.
31. *Psylla kwonnabiae* Kwon sp. nov.
32. *Psylla nopeunsanicola* Kwon sp. nov.

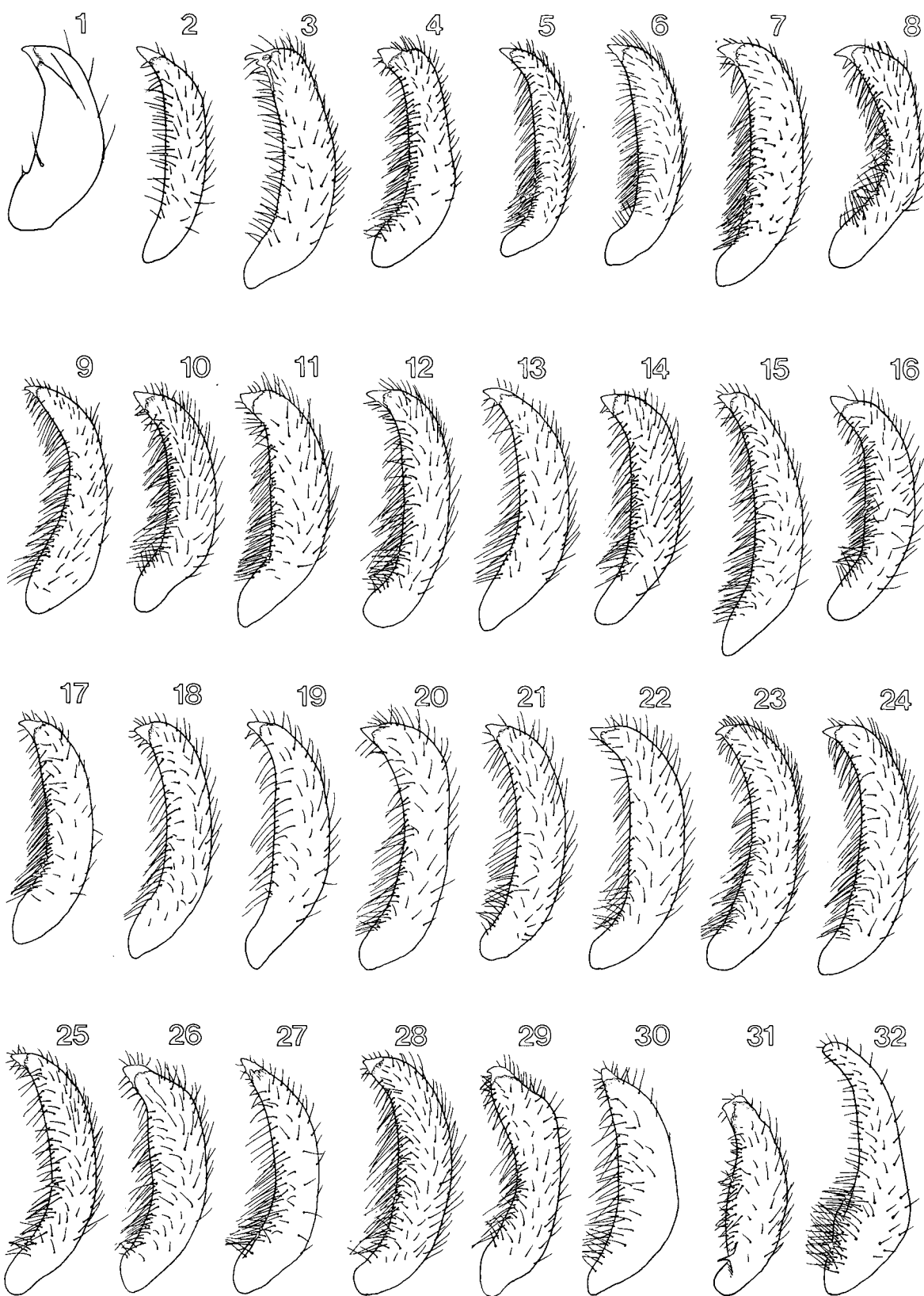


Plate XXXI.

Parameres of psylloids in caudal view (2).

1. *Psylla subcoccinea* Kwon sp. nov.
2. *Calophya shinjii* Sasaki, 1954
3. *Bactericera distinctissima* Kwon et Lee, 1981
4. *Bactericera miyatakei* Kwon et Lee, 1981
5. *Bactericera yamagishii* Kwon et Lee, 1981
6. *Heterotrioza chilgia* (Park et Lee, 1980)
7. *Heterotrioza noknamui* Kwon et Lee, 1981

Aedeagi of psylloids in lateral view (1).

8. *Livia jesoensis* Matsumura, 1908
9. *Syringilla humerosa* (Loginova, 1967)
10. *Koreaphalara koreana* Kwon gen. et sp. nov.
11. *Aphalara polygoni* Foerster, 1848
12. *Aphalara itadori* (Shinji, 1938)
13. *Aphalara jungsukae* Kwon sp. nov.
14. *Aphalara fasciata* Kuwayama, 1908
15. *Craspedolepta conspersa* (Loew, 1888)
16. *Anomoneura mori* Schwarz, 1896
17. *Euphalerus robinae* (Shinji, 1938)
18. *Acizzia sasakii* (Miyatake, 1963)
19. *Acizzia jamatonica* (Kuwayama, 1908)
20. *Cyamophila hexastigma* (Horváth, 1899)
21. *Psylla alni* (Linnaeus, 1758)
22. *Psylla pyrisuga* Foerster, 1848
23. *Psylla mali* (Schmidberger, 1836)
24. *Psylla peninsularis* Kwon sp. nov.
25. *Psylla peninsularis hanlasanensis* Kwon sp. et ssp. nov.
26. *Psylla fulguralis* Kuwayama, 1908
27. *Psylla elaeagni* Kuwayama, 1908
28. *Psylla elaeagnicola* Miyatake, 1963 (from Mt. Hanlasan).
29. *Psylla elaeagnicola* Miyatake, 1963 (from Samnam Myeon).
30. *Psylla elaeagnicola* Miyatake, 1963 (from Mt. Palgongsan).
31. *Psylla elaeagnicola* Miyatake, 1963 (from Mt. Hanlasan).
32. *Psylla palgongsana* Kwon sp. nov.
33. *Psylla pseudoviburni* Kwon sp. nov.
34. *Psylla juwangsana* Kwon sp. nov.
35. *Psylla fatsiae* Jensen, 1957
36. *Psylla seonhyeongae* Kwon sp. nov.
37. *Psylla silvestris* Kwon sp. nov.

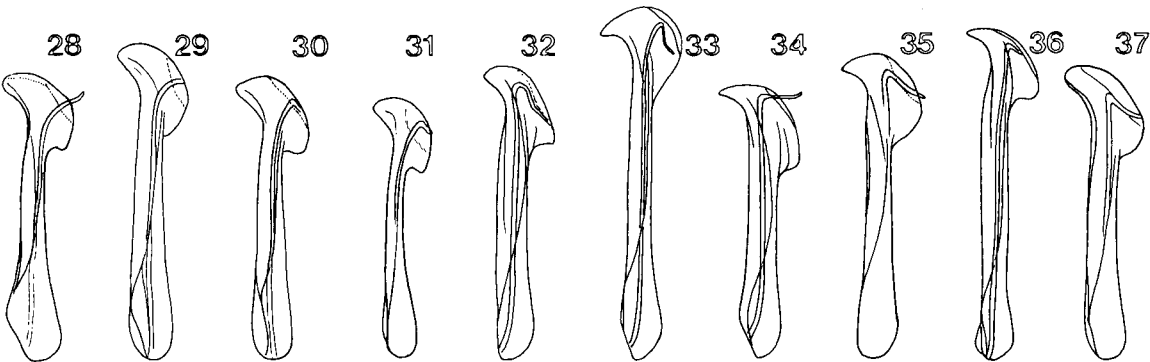
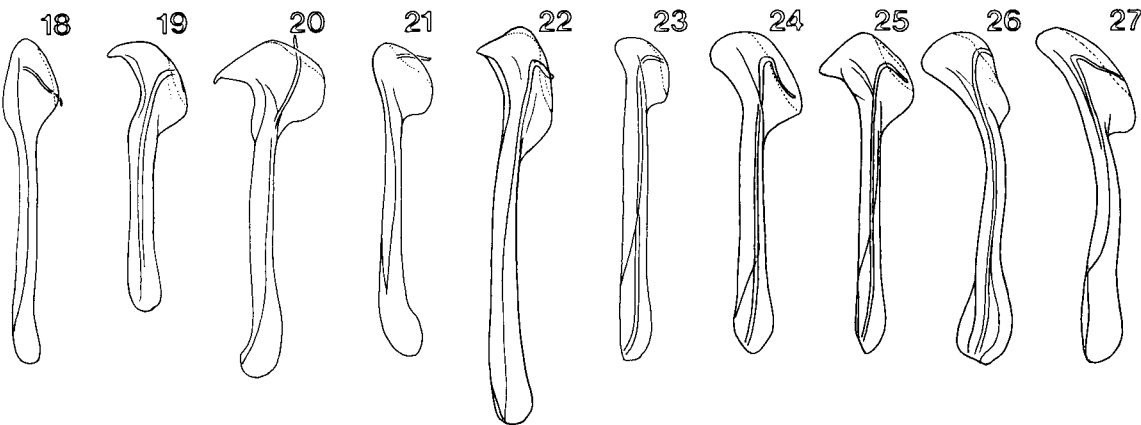
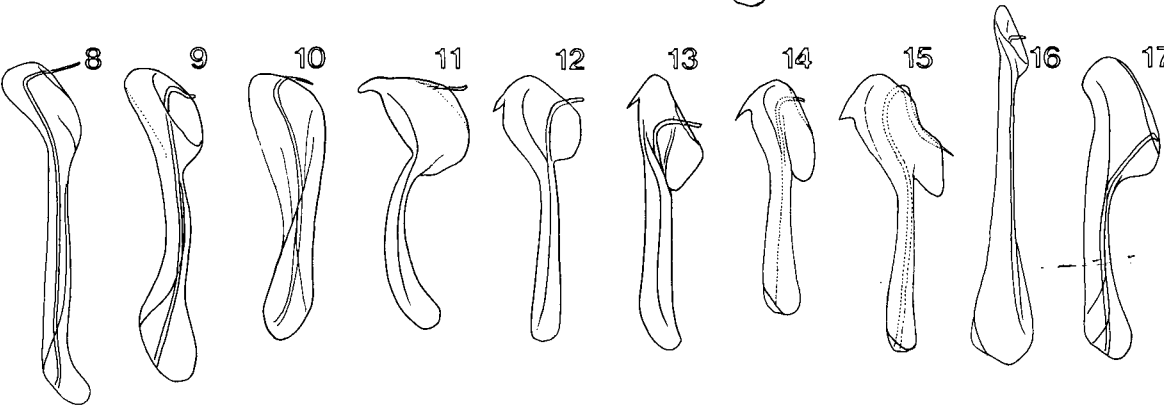
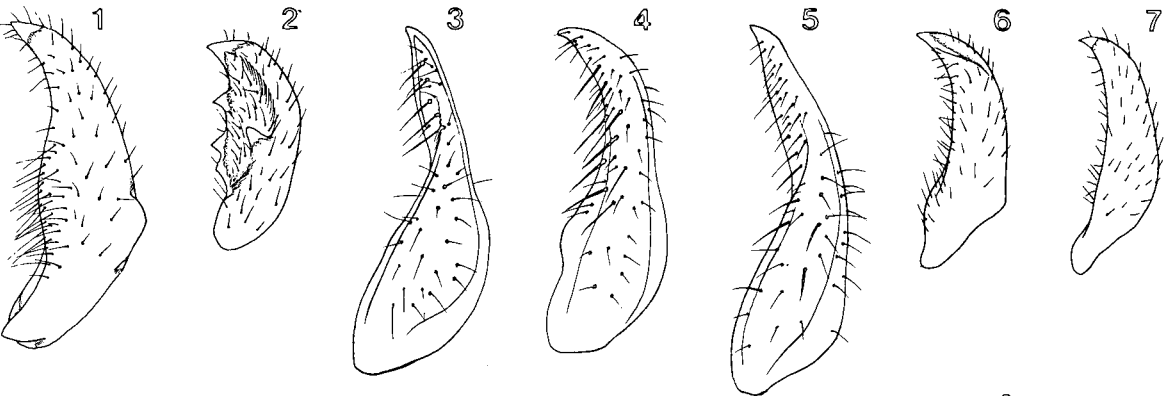


Plate XXXII.

Aedeagi of psylloids in lateral view (2).

1. *Psylla ambigua* Foerster, 1848
2. *Psylla tobirae* Miyatake, 1964
3. *Psylla rhododendri* Puton, 1871
4. *Psylla seolagsana* Kwon sp. nov.
5. *Psylla koreacola* Kwon sp. nov.
6. *Psylla coccinea* Kuwayama, 1908
7. *Psylla quelparticola* Kwon sp. nov.
8. *Psylla ulleungensis* Kwon sp. nov.
9. *Psylla bibari* Kwon sp. nov.
10. *Psylla pyricola* Foerster, 1848
11. *Psylla jukyungi* Kwon sp. nov.
12. *Psylla hederæ* Miyatake, 1964
13. *Psylla lineaticeps* Kwon sp. nov.
14. *Psylla abietis* Kuwayama, 1908
15. *Psylla truncaticephala* Kwon sp. nov.
16. *Psylla obongsana* Kwon sp. nov.
17. *Psylla kwonnabiae* Kwon sp. nov.
18. *Psylla sangjaei* Kwon sp. nov.
19. *Psylla nopeunsanicola* Kwon sp. nov.
20. *Psylla subcoccinea* Kwon sp. nov.
21. *Pachypsylla japonica* Miyatake, 1968
22. *Calophya shinjii* Sasaki, 1954 (from Mt. Palgongsan).
23. *Calophya shinjii* Sasaki, 1954 (from Is. Ulleungdo).
24. *Epitrioza mizuhonica* Kuwayama, 1910
25. *Epitrioza yasumatsui* Miyatake, 1978
26. *Trichohermes grandis* Loginova, 1965
27. *Bactericera distinctissima* Kwon et Lee, 1981
28. *Bactericera myohyangi* (Klimaszewski, 1968)
29. *Bactericera miyatakei* Kwon et Lee, 1981
30. *Bactericera koreostriola* Kwon sp. nov.
31. *Bactericera yamagishii* Kwon et Lee, 1981
32. *Heterotrioza obliqua* (Thomson, 1877)
33. *Heterotrioza chilgia* (Park et Lee, 1980)
34. *Heterotrioza noknamui* Kwon et Lee, 1981
35. *Trioza abdominalis* Flor, 1861
36. *Trioza nigra* Kuwayama, 1910

